QUANTA RESOURCES A/K/A REVIEW AVE. DEVELOPMENT II (DAR SITE ID #39)

Address:	37-80 Review Avenue, Long Island City, New York 11101
Tax Lot Parcel(s):	Queens Block 312, Lot 69
Latitude:	40.70716
Longitude:	-73.93008
Regulatory Programs/ Numbers/Codes:	NYSDEC ID No. 241005, USEPA ID No. NYD980592562, NYSDEC Spill No. 9805947, 8902524, 9412304, 9200570, 0707419, 0707417, and 0707418, MOSF No. 2-1920
Analytical Data Status:	☐ Electronic Data Available ☒ Hardcopies only ☐ No Data Available

1 SUMMARY OF CONSTITUENTS OF POTENTIAL CONCERN (COPCs) TRANSPORT PATHWAYS TO THE CREEK

The current understanding of the transport mechanisms of contaminants from the upland portions of the Quanta Resources, also known as Review Avenue Development II (RAD II), site (site) to Newtown Creek is summarized in this section and Table 1 and supported in the following sections.

Overland Transport

The site is located approximately 500 feet from Newtown Creek. Site occupants have had a 5-foot-wide easement extending from the southwestern corner of the property southwest to Newtown Creek since at least 1931 (Walter R. Ray Holdings Co., Inc. 1967). The easement was intended for petroleum conveyance pipelines, conduits, and private utilities. A fireproof structure or shed to store pumping equipment for the pipelines was also permitted on the easement (Walter R. Ray Holdings Co., Inc. 1967; 37-80 Review 2005). In 1980, New York State Department of Environmental Conservation (NYSDEC) inspectors noted oil residue on the ground from leaks throughout the site (Riordan 1980). Between 1980 and 2007, several spills impacting surface soils were documented at the site (NYSDEC 2012; EDR 2010).

Overland transport is a potentially complete historical pathway. There is insufficient evidence to make a current pathway determination.

Bank Erosion

This site is not adjacent to Newtown Creek or its associated waterways. Site occupants have had a 5-foot-wide easement extending from the southwestern corner of the property southwest to Newtown Creek since at least 1931 (Walter R. Ray Holdings Co., Inc. 1967). Pipelines conveyed oil and waste oil between the site and the creek via the easement. A timber bulkhead and later a combination timber bulkhead and sheetpile bulkhead existed along the shore (War Department 1884; USACE 1890, 1926, 1932, 1953, 1965, 1978; AACC 1930). The various bulkheads' conditions over time is not known. There is insufficient evidence to make a current or historical pathway determination.

Groundwater

Groundwater at the site exists at approximately 10 to 20 feet below ground surface (bgs) and flows south/southwest toward Newtown Creek. By 1982, approximately 80,000 gallons of light nonaqueous phase liquid (LNAPL; 3 to 7 feet thick) were floating on shallow, unconfined groundwater at the site. Up to 143 parts per million (ppm) of polychlorinated biphenyls (PCBs) were detected in samples collected from the plume (Harrington 1997; Golder 2005b). The primary on-site source of LNAPL was a tank farm located on the northeastern corner of the site. An additional LNAPL source exists on the adjoining Review Avenue Development I site (RAD I; DAR Site ID No. 41). The LNAPL plume extended off site to the south. At the time of the Remedial Investigation (RI), LNAPL had not been detected in monitoring wells GAL-27, GAL-28, or MW-9 (located on RAD I site to the south of the railroad right-of-way [ROW]; LMS 1990; EDR 2010; Golder 2005b).

Dissolved volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals were also discovered beneath the site in 1982 (Ott 1982; Golder 2005a). VOCs, polycyclic aromatic hydrocarbons (PAHs), SVOCs, and metals were detected during groundwater sampling and analysis conducted between 1988 and 2005 (Golder 2005b). Groundwater is a potentially complete current and historical pathway.

Overwater Activities

The site is not adjacent to Newtown Creek or its associated waterways. Deeds for the property indicate that since at least 1931 site occupants have had a 5-foot-wide easement extending from the southwestern corner of the property southwest to Newtown Creek and the right to dock "vessels, barges, or other carriers" at the bulkhead. The easement was intended for petroleum conveyance pipelines, conduits, and private utilities (Walter R. Ray Holdings Co., Inc. 1967; 37-80 Review 2005). In 1965, fuel oil was delivered by barge and piped from the bulkhead to the site via a 6-inch-diameter pipeline. In 1978, waste oil was shipped from the site by barge (USACE 1965). Two 6-inch-diameter pipelines extended to the wharf from four steel storage tanks (9,500-capacity barrels) located on the site (USACE 1978). No additional information about these activities was identified in documents available for review and it is not known if overwater activities currently occur in the easement. Overwater activities is a potentially complete historical pathway. There is insufficient evidence to make a current pathway determination.

Stormwater/Wastewater Systems

The site discharged untreated stormwater and wastewater from at least the 1930s through to the early 1970s via an 8-inch-diameter discharge pipe that extended from the southwestern corner of the site to Newtown Creek (LMS 1990; Golder 2005b; Diamond 1971; Newman 1971; NYSDEC 1972). In 1972, the site signed an Order on Consent agreeing to abate discharge to Newtown Creek and to submit engineering plans for improvements to the site's existing drainage and sanitary sewer infrastructure and was issued a permit for those improvements (Diamond 1971; Newman 1971; NYSDEC 1972). Schematic site plans created during site investigations conducted in the 1980s indicate that wastewater (sanitary and process) was discharged to the municipal sewer located in Review Avenue (LMS 1990; Golder 2005b). The property was redeveloped between 2008 and 2010 (EDR 2010). Information about the current on-site stormwater infrastructure was not identified in documents available for review. Direct discharge of stormwater and wastewater is a complete historical pathway and a potentially complete current pathway.

The site is currently located in the Bowery Bay Water Pollution Control Plant (WPCP) sewershed. Wastewater discharges from the site are conveyed to the WPCP for treatment prior to discharge. Although wastewater discharges from the site flow into a separate local municipal system, it is likely that the separate local system flows into a larger combined

system prior to reaching the treatment plant. When the combined flows exceed the system's capacity, untreated combined sewer overflows (CSOs) are discharged to Newtown Creek (NYCDEP 2007). There is insufficient evidence to make a current or historical pathway determination.

Air Releases

In 2008, three ambient air samples were collected and analyzed during soil vapor investigations at the site (Geosyntec 2008). There is insufficient evidence to make a current or historical pathway determination.

2 PROJECT STATUS

The site is listed on the New York State Registry of Inactive Hazardous Waste Disposal Sites as a "Class 2" site (i.e., the disposal of hazardous waste has been confirmed and the presence of such hazardous waste or its components or breakdown products represent a significant threat to the environment or to health; Crotty 2002). A summary of the investigations and remedial activities at the site is provided in the following table:

Activity		Date(s)/Comments
Phase 1 Environmental Site Assessment	☐	
Site Characterization	☒	September 1984/Engineering Investigation at Inactive Hazardous Waste Sites Phase I Investigation, Woodward-Clyde Consultants, Inc. May 1990/Engineering Investigation at Inactive Hazardous Waste Sites Phase II Investigation, Lawler, Matusky & Skelly Engineers
Remedial Investigation	☒	January 2005/Phase I Remedial Investigation, Golder Associates June 2005/Phase II Remedial Investigation, Golder Associates
Remedy Selection	☒	July 2005/Feasibility Study Report, Golder Associates June 2006/Proposed Remedial Action Plan, New York State Department of Environmental Conservation

Activity		Date(s)/Comments
Remedial Design/Remedial Action Implementation	☒	1982/Emergency Remedial Action, New York City Department of New York City Department of Environmental Protection and OH Materials June 2008/ LNAPL Recovery Pilot Work Plan, Golder Associates November 2008/Soil Vapor Investigations Phase I, Geosyntec Consultants February 2009/Soil Vapor Investigations Phase II, Geosyntec Consultants
Use Restrictions (Environmental Easements or Institutional Controls)	☒	September 2005/Declaration of Easements, Covenants and Restrictions, 37-80 Review, LLC
Construction Completion	☐	
Site Closeout/No Further Action Determination	☐	

3 SITE OWNERSHIP HISTORY

Respondent Member:

☐ Yes ☒ No

Owner	Years	Occupant	Type of Operation
Unknown	1880s/1890s	Queen County Oil Works	Manufactured gasoline, kerosene, astral, distillate fuel oils, light gas oil, and heavy fuel oils
American Agricultural Chemical	Unknown – 1931	Triplex Oil Refining Company, Incorporated City Oil Service, Inc.	Refined used crankcase oil and collected waste petroleum products
Walter R. Ray Holding Company	1931 – 1967		
Triplex Oil Refining Company, Incorporated	1967 – 1970		
Pentalic Corporation (Louis Strick, President)	1970 – 1972		

Owner	Years	Occupant	Type of Operation
Sea Lion Corporation (Russell W. Mahler, President)	1972 – 1976	Quanta Resources Corporation, Newtown Oil Refining , Hudson Oil Corporation, Edgewater Terminal, Northeast Oil Service, and Diamond Head Refining Company	Refined and stored used crankcase oil
Ag-Met Oil Service, Inc. (changes name to Newtown Refining Corporation; (Russell W. Mahler, President)	1976 – 1979		
Hudson Oil Refining Corporation (Russell W. Mahler, President)	1979		
Portland Holding Corporation (Russell W. Mahler, President)	1979 – 1980		
Quanta Resources Corporation (Russell W. Mahler, President)	1980 – 1993	Quanta Resources Corporation (1980 – 1981)	Recycling, processing, and/or storing used and unused oils, solvents, and miscellaneous waste materials
State of New York (Foreclosure)	1993 – 2005	Quanta Administrative Group	Remedial investigations and activities
37-80 Review, LLC	2005 – present	Unknown	Unknown

Note:
Additional discussion and sources provided in Section 6.

4 PROPERTY DESCRIPTION

The property occupies approximately 0.173 acre. There is a gentle regional slope down to the west towards Newtown Creek, which is located approximately 500 feet west of the property. On-site elevations range from approximately 30 feet above mean sea level on the eastern property boundary along Review Avenue to approximately 15 feet above mean sea level on the western property boundary along the Long Island Railroad (LIRR) tracks. There are no buildings on site. The entire site is paved (see Figure 1; EDR 2010).

The site is bounded to the northeast by Review Avenue, to the south and southeast by Former Pratt Oil Works (DAR Site ID #56), to the southwest by the LIRR, and to the north and northwest by RAD I (DAR Site ID #41). Calvary Cemetery is located to the north and east of the site across Review Avenue (see Figure 1; Golder 2005b). The area is zoned M3-1.

M3 districts are designated for areas with heavy industries that generate noise, traffic, or pollutants (NYCDCP 2011a, 2011b).

5 CURRENT SITE USE

The site and the RAD I site (Lots 41, 279, and 280) were accepted into the Brownfield Cleanup Program (BCP) program in 2006. The plan called for RAD I Lot 41 to be developed as a warehouse and the site to be developed as an overflow truck parking area (EDR 2010). Lot 41 is currently occupied by the Angel Aerial Company, who rents equipment (such as box trucks, cube trucks, water trucks, tractors, cars, lifts, scaffolding, heaters, and air conditioners) to the film and television industry (Angel Aerial 2012; NYCDCP 2011a).

Recent aerial photographs indicate that the site is paved and used for parking or storing of tractor trailer trucks (see Figure 1; Google Earth 1994-2010). Most of the on-site structures (buildings, tanks, etc.) were demolished in the early 1980s. Historic aerial photographs indicate that several large vertical aboveground storage tanks (ASTs) remained on the property until at least 2006. Construction activities can be seen in aerials from 2008 (Google Earth 1994-2010). The site was classified as a large and small quantity generator in 2006 and 2008, respectively (EDR 2010).

6 SITE USE HISTORY

Dilapidated brick buildings of an oil refinery occupied the site in 1898 (Sanborn 1898). By 1915, the structures had been removed from the site, and the property was vacant. The American Agricultural Chemical Company (AACC) facility was operating on the nearby property located west of the site between the LIRR tracks and Newtown Creek (Lot 279; Sanborn 1915). By the 1920s, the Triplex Oil Company (Triplex)—a crankcase oil refinery—occupied the site (Chamber of Commerce 1927). Although ownership of the business and property changed hands, the site was primarily in similar uses (e.g., oil recycling, disposal, and refining) until the early 1980s (Golder 2005b).

Between 1972 and 1980, Russell W. Mahler created six different corporations that operated at the site, including Quanta Resources Corporation (Quanta), Newtown Oil Refining, Hudson Oil Corporation, Edgewater Terminal, Northeast Oil Service, and Diamond Head

Refining Company. The businesses illegally disposed of toxic materials in landfills, unused land, surface waters, and the municipal sewer in Queens (Blumenthal 1982). In 1992, a Judgment on Consent required several businesses that had used Quanta as a waste disposal vendor to pay damages for the release of industrial and chemical wastes at five municipal landfills owned and/or operated by the City of New York (Sherwood 1992).

On October 6, 1981, Quanta initiated bankruptcy proceedings. In November 1981, Quanta converted from Chapter 11 to Chapter 7 liquidation, and Thomas J. O'Neill was appointed Trustee (LMS 1990). The property was abandoned by the Trustee due to the anticipated expense of an environmental cleanup at the site (Nolan, Bell & Moore 1982; Ott 1982). Security personnel were removed from the front gate on May 7, 1982 (LMS 1990). Concern for public welfare prompted the New York City Department of Environmental Protection (NYCDEP) officials to execute an emergency remedial action and enter the property to assess and respond to unsafe conditions (EDR 2010; Woodward-Clyde 1984).

In 1984, Woodward-Clyde Consultants, Inc., conducted Engineering Investigations for NYSDEC at several inactive hazardous waste sites, including the site (Woodward-Clyde 1984). Phase II site investigations at the site were conducted by Lawler, Matusky & Skelly Engineers in 1988 and 1990 (LMS 1990). The RI at the site began in 2003 (Golder 2005b).

The site was accepted into the BCP in 2006. A Proposed Remedial Action Plan (PRAP) was issued by NYSDEC in June 2006. DMJ Associates, LLC, 37-80 Review LLC, and Cresswood Environmental Consultants, LLC, were the Volunteer Applicants for the site (NYSDEC 2006). The Record of Decision (ROD) was signed on February 9, 2007. Site redevelopment was in tandem with the RAD I site (DAR Site ID #41). The RAD I site included two discontiguous tax lots (known as the North and South Capasso properties). The North Capasso property (Lot 41) was adjacent to the north/northeast site property boundary. The South Capasso property (Lots 279 and 280) was located to the south/southwest of the site on the far side of the LIRR tracks adjacent to Newtown Creek (EDR 2010).

7 CURRENT AND HISTORICAL AREAS OF CONCERN AND COPCs

The current understanding of the historical and current potential upland and overwater areas of concern at the site is summarized in Table 1. The following sections provide a brief discussion of the potential sources and COPCs at the site.

Areas of concern include a tank farm, overwater product transfer via pipelines, on-site waste disposal, on-site operations (including oil recycling, disposal and re-refining, processing and storage or waste and lubricating oil), discharge of wastes to the municipal sewer, open-diked containments areas, open drums, and vats and metal tanks in poor condition, on-site lagoon, oil water separator and boiler blowdown discharges to creek, and off-site LNAPL plumes. COPCs associated with these areas of concern include VOCs, SVOCs, metals, PAHs, PCBs, total petroleum hydrocarbon (TPH), chlorinated volatile organic compounds (CVOCs).

7.1 Uplands

By the 1920s, Triplex occupied the site (Chamber of Commerce 1927). The Triplex facility included a warehouse, a boiler house, 12 ASTs containing oil in the northeastern corner of the site enclosed by a concrete wall, seven settling tanks in the center of the site enclosed by a concrete wall, five lubricating oil tanks in the northwestern corner of the site enclosed by a concrete wall, a clay handling and staging building located on the southeastern portion of the site, a pump house located on the western property boundary, and miscellaneous tanks located throughout the site containing acid, still bottoms, chemicals and "oil and earth" (Sanborn 1950; Golder 2005b).

In 1931, the AACC allowed Triplex to connect with and use an existing 6-inch-diameter sewer pipe located on present-day RAD I. AACC also granted Triplex a ROW to construct, maintain, replace, operate, and remove sewer, water, other pipelines, conduits, and private utilities through and under a 5-foot-wide easement located on the present-day property boundary of RAD I and the Standard Oil property (Standard Oil occupied the southern adjoining property, the location of the present-day Former Pratt Oil Works [DAR Site ID# 56]). Pipelines were required to be less than 2.5 feet below the established grade. A portion of the easement was below the ordinary high water mark for Newtown Creek and, therefore, subject to the right of the state or federal government to regulate and change the

pierhead and bulkhead line. Triplex also held the right to dock "vessels, barges, or other carriers" at the bulkhead in front of the 5-foot-wide easement and to overlap with the bulkhead of the AACC property immediately to the north. Triplex was permitted to construct a fireproof structure or shed on the easement to be used for the installation and storage of pumping equipment for pipelines. The dimensions of the structure could not exceed 5 feet in length, 10 feet in width, and10 feet in height (Walter R. Ray Holdings Co., Inc. 1967; 37-80 Review 2005; AACC 1930).

In 1979 and 1980, the site was listed as an unverified hazardous waste generator (EDR 2010). Quanta submitted an initial notification of hazardous waste activity to treat, store, and dispose of "possibly toxic" waste on October 17, 1980 (DiLibero 1980). The site was required to provide additional information. On November 18, 2011, the site reported that crankcase oils were stored in one of two on-site staging tanks (30,000 and 50,000 gallons, respectively) and were sampled prior to transport to Quanta's facility in Edgewater, New Jersey. On-site equipment also included a 600-gallon storage tank, an 80,000-gallon storage tank, and a 20-gallon-per-hour incinerator. Several additional inactive tanks remained at the site. Estimated annual quantities of waste were given as 900 pounds of K054 (Chrome Shavings of Leather Industry), 400 pounds of D002 (Spent Acids), 100 pounds of D001 (Petroleum Distillates), and 999,999,999 pounds of "D000 (Unidentified Waste)". Wastes were ultimately landfilled or incinerated (Prashker 1980).

In June 1982, following the abandonment of the property, NYCDEP conducted an initial assessment of the site and found approximately 530,000 gallons of liquid and sludge materials in more than 90 separate tanks, several thousand gallons of PCB oil, 100,000 gallons of PCB-contaminated oil and sludge, open-diked containment areas, open drums, and vats and metal tanks in poor condition, containing and leaking oil, chemicals, accumulated rainwater, and low flashpoint materials that presented a fire hazard. The NYCDEP's contractor, OH Materials (OHM), completed the inventory and produced a report on September 1, 1982. OHM searched for hidden and buried tanks and conducted a magnetometer scan. A total of 106 ASTs and underground storage tanks (USTs) were inventoried and evaluated. A historical site plan is included as Attachment 1 (Ott 1982; Golder 2005b).

OHM was authorized to remove hazardous materials from the site and completed this work on December 1, 1982. OHM removed more than 500,000 gallons of liquids and 900 cubic yards (cy) of solids. Materials removed from the site included recyclable oil, PCB oil, PCB sludge, cyanide solution, and PCB-contaminated diesel fuel. Hazardous wastes generated at the site included D004 (arsenic), D007 (chromium), D008 (lead), D018 (benzene), D027 (1,4-dichlorobenzene), D039 (tetrachloroethylene), D040 (trichloroethylene), and B007 (other PCB wastes; EDR 2010). NYCDEP recommended that subsurface investigations be conducted to determine the extent of PCB impacts to soil and groundwater (Ott 1982). These investigations are discussed in Section 9.

The RI concluded that the primary LNAPL source area at the site was the historical tank farm formerly located on the northeastern portion of the property. The tanks had been empty since the early 1980s and were removed from the site around 2006 (Golder 2005b; Google Earth 1994 - 2010). An LNAPL plume on the northern adjoining RAD I site (Lot 41) is an additional source area (Golder 2005b).

7.2 Overwater Activities

This site is not adjacent to Newtown Creek or its associated waterways. Deeds for the property indicate that since at least 1931 occupants have had the right to dock "vessels, barges, or other carriers" at the bulkhead in front of the 5-foot easement and to overlap with the bulkhead of RAD I immediately to the north (Walter R. Ray Holdings Co., Inc. 1967; 37-80 Review 2005).

The U.S. Army Corps of Engineers (USACE) Port of New York, New York, and New Jersey reports published in 1926, 1932, 1953, 1965, and 1978 documented wharf activities and infrastructure at properties along Newtown Creek and included the site. Site information provided in the USACE reports is summarized in the following paragraphs.

In 1926, the bulkhead at the AACC wharf is described as a timber bulkhead with earth fill (USACE 1932). In 1953, the bulkhead is described as 450- foot timber and 50-foot steel sheet pile bulkhead with solid fill (USACE 1952). In 1965, the wharf received fuel oil for plant consumption and shipment of tallow by barge. Pipelines extended from the wharf to upland

areas at the site and the adjacent RAD I site. A 6-inch diameter fuel oil pipeline extended from the dock to three steel storage tanks (9,520-capacity barrels) at the Quanta site. The wharf was connected to LIRR and to a plant "located in rear" by rail spur. The bulkhead was described as a 431-foot timber and 310-foot steel sheet pile bulkhead supported by solid fill (USACE 1965).

In 1978, the wharf was owned by the Van Iderstine Company and operated by the Newtown Refining. Waste oil was shipped from the site by barge. Two 6-inch-diameter pipelines extended to the wharf from four steel storage tanks (9,500-capacity barrels) located "at terminal in rear." The wharf was connected to LIRR by spur and to Review Avenue by paved road. The bulkhead is described as timber and steel sheet pile with asphalt-surfaced fill (USACE 1978). No additional information about these activities was identified in documents available for review.

7.3 Spills

Documented spills at the site are summarized as follows:

- On April 25, 1980, a joint NYSDEC and New York State Department of Health (NYSDOH) inspection of the site, referred to as the Hudson Oil Newtown Refinery, was performed. Operations at the site were described as the processing and storage of waste lubricating oil. Leakage of materials was observed at several locations at the site. The site was used for hazardous waste disposal since the 1960s. The inspectors recommended that the site be monitored closely in the future due to the large number of complaints received (NYSDEC and NYSDOH 1980).
- On May 22, 1980, NYSDEC representatives visited the site. Oil residue and tar-like residues were observed on road surfaces at oil drop locations and near the boiler house and dehydrator tanks. Evidence of oil, grease, and tarry residue were observed on catwalks and ladders. Standing water and oily residue were noted at the bases of several tanks. Representatives also noted that several of the tanks were rusting and partially covered (Riordan 1980).
- On June 10, 1989, an unknown quantity of "decon" water was spilled on soil at 37-80 Review Avenue (NYSDEC No. 8902524). The spill case was closed on September 8, 1997 (NYSDEC 2012).

- On December 14, 1994, 50 gallons of gasoline from an unknown cause was spilled on soil at 37-80 Review Avenue (NYSDEC No. 9412304). The spill case was closed on December 14, 1994 (NYSDEC 2012).
- On August 12, 1998, an unknown quantity of an unknown hazardous material was identified in soil from abandoned drums at 37-80 Review Avenue (NYSDEC No. 9805947). The spill case was closed on August 17, 1998 (NYSDEC 2012).
- On October 5, 2007, LNAPL was observed in a pipe that originated at the site (NYSDEC Spill No. 0707417 at 38-70 Review Avenue and No. 0707418 at 38-50 Review Avenue). Soil and groundwater was affected (EDR 2010; NYSDEC 2012).

8 PHYSICAL SITE SETTING

8.1 Geology

The stratigraphy at the site was documented during the RI as follows:

- Urban fill generally consist of silty fine sand and gravel intermixed with debris from 0.5 to 16 feet bgs.
- Unconsolidated glacial deposits consist of interbedded horizons of fine to coarse sand and fine to coarse gravel exist from 16 to 71 feet bgs. Discrete and laterally discontinuous lenses of silt and clays are intermixed with the glacial deposits. The glacial deposits change in color at 30 feet below mean sea level from dark gray (upper) to yellowish brown (lower).
- Laterally continuous, finely laminated to thinly bedded, silty clay, silt or clay (Raritan Clay) at 75 feet bgs (Golder 2005a).

Geologic cross sections and a Conceptual Site Hydrogeologic Model were created during the RI and are included as Attachments 2 and 3 (Golder 2005b).

8.2 Hydrogeology

Depth to groundwater at the site is between 10 and 20 feet bgs. Unconfined groundwater flows in a south-southwest direction within the glacial deposits. A groundwater contour map created during the RI is included as Attachment 4. Precipitation and tides have been shown to influence groundwater elevations, but neither has been shown to alter flow

direction. A localized groundwater mound, thought to be caused by discontinuous clay lens, exists on the RAD I site (Lots 279 and 280) located between the site and Newtown Creek (Golder 2005b).

Average vertical and horizontal gradients were calculated from synoptic water level measurements collected in July and August 2004. They indicate that the predominant direction of flow is in the horizontal direction. The average horizontal gradient was 0.0015 feet/feet. The average vertical gradient was 0.0002 feet/feet downward in July. In August, there was no vertical gradient. Hydraulic conductivity of the glacial deposits was estimated from the results of slugs tests and ranged from 62.5 to 1.5 feet per day (feet/day) with a geometric mean value between 12 feet/day (Hvorslev method) and 10.9 feet/day (Bouwer and Rice Method; Golder 2005b).

9 NATURE AND EXTENT (CURRENT UNDERSTANDING OF ENVIRONMENTAL CONDITIONS)

Following the 1982 Emergency Remedial Action, OHM conducted an investigation that included the installation of monitoring wells and the collection and analysis of groundwater, LNAPL, and soil samples at the site (Golder 2005b). In 1988, Lawler, Matusky & Skelly Engineers began Phase II site investigations that included the installation of additional monitoring wells and the collection and analysis of soil, surface water, and groundwater samples (LMS 1990).

Phase I of the RI involved soil, LNAPL, and groundwater investigations (Golder 2003) and was conducted between October 2003 and January 2004 (Golder 2005a). Phase II of the RI included activities specified in Addendum No. 2 (June 15, 2004) and No. 3 (December 17, 2004) intended to further characterize LNAPL. These activities included off-site additional borings, monitoring well installation, and sampling and analysis (Golder 2005b). In 2008 and 2009, soil vapor investigations were conducted on site and at an adjoining property (Geosyntec 2008, 2009).

9.1 Soil

Soil Investigations ☒ Yes ☐ No
Bank Samples ☐ Yes ☒ No ☐ Not Applicable
Soil-Vapor Investigations ☒ Yes ☐ No

9.1.1 Soil Investigations

Ten soil borings were completed during the 1982 Emergency Remedial Action; however, these results were not available for review. Four shallow soil samples (SS-1, SS-2, SS-3, and SS-4) were collected during the Phase II site investigation and analyzed for metals, VOCs, SVOCs, pesticides, and PCBs. Sample locations are provided on Attachment 5 (LMS 1990).

During the RI, 50 subsurface soil samples were collected from 13 soil borings at the site. Five surface soil samples (SS-01, SS-02, SS-03, SS-04, and SS-05) were collected from soils 0 to 2 inches bgs in unpaved areas at the site. Surficial soil samples were analyzed for PAHs, PCBs, and metals. Subsurface soil samples were analyzed for VOCs, SVOCs, PAHs, PCBs, and metals. Results were compared to the NYSDEC recommended soil cleanup objectives contained in Appendix A of the Technical Assistance and Guidance Memorandum (TAGM) 4046. Metals results were also compared to soil background values for New York State and the Eastern United States, as well as the background concentrations detected in samples collected from GAGW-04 located across Review Avenue from the site (Golder 2005b). Results are summarized in the following table and on Attachment 6. RI results are limited to analytes present at concentrations in excess of the standards previously discussed.

Analyte	Units	Minimum Soil Concentration	Maximum Soil Concentration
1988 and 1990 sampling events (shallow soils, specific depths not provided)			
CVOCs			
Tetrachloroethylene	mg/kg	1	9,700
Trichloroethylene	mg/kg	NR	16,000
1,1-dichloroethane	mg/kg	2	1,300
1,1,1-trichloroethane	mg/kg	NR	10,000
1,2-dichloroethane	mg/kg	NR	650
1,2-dichlorobenzene	mg/kg	ND	17

Analyte	Units	Minimum Soil Concentration	Maximum Soil Concentration
Trichlorobenzene	mg/kg	ND	7.8
VOCs			
Benzene	mg/kg	NR	600
Toluene	mg/kg	NR	32,000
Ethylbenzene	mg/kg	NR	9,200
Xylene (total)	mg/kg	25	44,000
4-methyl-2-pentanone	mg/kg	NR	13
Styrene	mg/kg	NR	76
PAHs			
Total PAHs	mg/kg	63.5	625.8
PCBs			
Aroclor 1260	mg/kg	ND	60
Metals			
Lead	mg/kg	2,000	116,000
Barium	mg/kg	768	1,570
Cadmium	mg/kg	5.3	14
Chromium	mg/kg	35	108
Copper	mg/kg	312	1070
Mercury	mg/kg	0.74	1.9
Zinc	mg/kg	988	2,270
2003 and 2004 sampling events during the RI			
Surficial soil (0 to 2 inches bgs)			
PAHs			
Benzo(a)anthracene	mg/kg	0.23	1.4
Benzo(a)pyrene	mg/kg	0.23	0.94
Benzo(k)fluoranthene	mg/kg	0.29	1.2
Chrysene	mg/kg	0.3	1.3
Dibenz(a,h)anthracene	mg/kg	ND	0.14
PCBs			
Total PCB (Aroclor 1260)	mg/kg	ND	15
Metals			
Calcium	mg/kg	1,640	76,100
Copper	mg/kg	25.3	388
Lead	mg/kg	46.1	913
Magnesium	mg/kg	1,520	22,000

Analyte	Units	Minimum Soil Concentration	Maximum Soil Concentration
Nickel	mg/kg	11.7	27.3
Zinc	mg/kg	66.2	334
Subsurface soil (Fill depth at site varies from 0.5 to 16 feet bgs. Samples were collected at 5-foot intervals throughout the fill.)			
VOCs			
Acetone	mg/kg	ND	8.4
Benzene	mg/kg	ND	0.63
Ethylbenzene	mg/kg	ND	11
CVOCs			
1,2-Dichlorobenzene	mg/kg	ND	11
1,1-Dichloroethane	mg/kg	ND	13
PAHs			
Benzo(a)anthracene	mg/kg	ND	21
Benzo(a)pyrene	mg/kg	ND	52
Benzo(a)fluoranthene	mg/kg	ND	7.8
Chrysene	mg/kg	ND	29
Dibenzo(a,h)anthracene	mg/kg	ND	14
Indeno(1,2,3-cd)pyrene	mg/kg	ND	12
Napthalene	mg/kg	ND	36
2-Methylnapthalene	mg/kg	ND	56
Phenols			
Phenol	mg/kg	ND	3.7
4-Methylphenol	mg/kg	ND	2.3
Phthalates			
Bis 2-ethylhexyl-phthalate	mg/kg	ND	120
PCBs			
Total PCBs (Aroclor 1242,1248, 1254, 1260)	mg/kg	ND	10.2
Metals			
Antimony	mg/kg	ND	76.6
Arsenic	mg/kg	ND	332
Cadmium	mg/kg	ND	16
Calcium	mg/kg	187	37,800
Chromium	mg/kg	1.4	57.1
Copper	mg/kg	2.2	1,130
Lead	mg/kg	1.6	608

Analyte	Units	Minimum Soil Concentration	Maximum Soil Concentration
Magnesium	mg/kg	88.2	11,800
Mercury	mg/kg	ND	27
Nickel	mg/kg	ND	98.3
Selenium	mg/kg	ND	125
Zinc	mg/kg	ND	1,310

Notes:
bgs – below ground surface
CVOC – chlorinated volatile organic compound
mg/kg – milligram per kilogram
ND – not detected, detection limits not provided in source documents
NR – not reported in source documents
PAH – polycyclic aromatic hydrocarbon
PCB – polychlorinated biphenyl
RI – Remedial Investigation
VOC – volatile organic compound

9.1.2 Soil Vapor Investigations

Phase I soil vapor investigation activities conducted in 2008 focused on the site, and Phase II activities conducted in 2009 addressed vapor intrusion concerns on adjoining properties. During Phase I, nine deep (13.5 to 15 feet bgs), six intermediate (8 feet bgs), and six shallow (4 feet bgs) soil borings were completed at the site. The highest concentrations of site contaminants of interest (COIs) were detected in samples collected in the northwestern portion of the site (Geosyntec 2008). Sample locations are shown on Attachment 7. Detected compounds are summarized in the following table:

Analyte	Units	Minimum Soil Vapor Concentration	Maximum Soil Vapor Concentration
Shallow (4 feet bgs)			
VOCs			
Toluene	ppbv	130	18,000
Xylene (total)	ppbv	191	8,400
Benzene	ppbv	33	20,000
Ethylbenzene	ppbv	60	2,600
1,2,4 – Trimethylbenzene	ppbv	40	2,800
1,3,5 – Trimethylbenzene	ppbv	33	290

Analyte	Units	Minimum Soil Vapor Concentration	Maximum Soil Vapor Concentration
CVOCs			
Tetrachloroethene	ppbv	130	2,000
Trichloroethene	ppbv	150	9,900
Cis-1,2- Dichloroethene	ppbv	37	34,000
1,1 – Dichlorethene	ppbv	15	200
Trans-1,2 – Dichloroethene	ppbv	NR	6
Vinyl Chloride	ppbv	41	220,000
Intermediate (8 feet bgs)			
VOCs			
Toluene	ppbv	9	9,400
Xylene (total)	ppbv	35	16,100
Benzene	ppbv	33	43,000
Ethylbenzene	ppbv	10	4,200
CVOCs			
1,2,4 – Trimethylbenzene	ppbv	40	13,000
1,3,5 – Trimethylbenzene	ppbv	5	3,900
Tetrachloroethene	ppbv	7	87
Trichlorethene	ppbv	180	420
Cis-1,2- Dichloroethene	ppbv	36	620
1,1 – Dichlorethene	ppbv	NR	14
Trans-1,2 – Dichloroethene	ppbv	10	12
Vinyl Chloride	ppbv	120	5,500
Deep (13.5 to 15 feet bgs)			
VOCs			
Toluene	ppbv	28	8,500
Xylene (total)	ppbv	144	31,200
Benzene	ppbv	33	16,000
Ethylbenzene	ppbv	27	13,000
1,2,4 – Trimethylbenzene	ppbv	71	48,000
1,3,5 – Trimethylbenzene	ppbv	7	23,000
CVOCs			
Tetrachloroethene	ppbv	8	520
Trichlorethene	ppbv	410	2,400
Cis-1,2- Dichloroethene	ppbv	30	4,200
1,1 – Dichlorethene	ppbv	NR	75

Analyte	Units	Minimum Soil Vapor Concentration	Maximum Soil Vapor Concentration
Trans-1,2 – Dichloroethene	ppbv	4	47
Vinyl Chloride	ppbv	40	18,000
PAHs			
Napthalene	ppbv	NR	120

Notes:
bgs – below ground surface
CVOC – chlorinated volatile organic compounds
NR – not reported in source documents
PAH – polycyclic aromatic hydrocarbon
ppbv – parts per billion by volume
VOC – volatile organic compounds

In December 2009, six soil vapor probes were installed to depths of 7 to 10 feet bgs on an adjoining property (the Phoenix Beverages property). Methane concentrations detected during field screening exceeded the lower explosive limit (LEL; Drew and McAlary 2009). The Phase II analytical results were not included in documents available for review.

9.1.3 Soil Summary

Soil investigations were conducted at the site in the 1980s during the Emergency Remedial Action and Phase II site investigation and in the 2000s during the RI (LMS 1990; Golder 2005b). Although the primary source materials (e.g., storage tanks and ancillary equipment) were removed during the 1982 Emergency Remedial Action, residual LNAPL was identified at the site during the RI. The primary source of the LNAPL was the tank farm located on the northeastern corner of the site (LMS 1990; Golder 2005b). Following RI activities, soil vapor investigations were performed at the site and the southern adjoining Phoenix Beverages property (Geosyntec 2008, 2009).

9.2 Groundwater

Groundwater Investigations	☒ Yes ☐ No
NAPL Presence (Historical and Current)	☒ Yes ☐ No
Dissolved COPC Plumes	☒ Yes ☐ No
Visual Seep Sample Data	☐ Yes ☒ No ☐ Not Applicable

9.2.1 Groundwater Investigations

Groundwater investigations were conducted at the site following the 1982 Emergency Remedial Action, during Phase II of the closed hazardous waste site investigations and Phases I and II of the RI (Golder 2005b).

OHM installed monitoring wells at the site in the early 1980s following the Emergency Remedial Action. Lawler, Matusky & Skelly Engineers installed additional wells during the Phase II site investigation in the late 1980s. Monitoring wells installed on the property and adjoining properties prior to the RI are as follows:

- Shallow monitoring wells: MW-1, MW-2, MW-3, MW-3R, and MW-9
- LNAPL smear zone wells: GW-1
- LNAPL monitoring wells: MW-4R, MW-6, MW-8, MW-10, MW-11, GW-2, and GW-3

During the RI, 20 LNAPL monitoring wells and eight groundwater monitoring wells were installed at the site and on adjoining properties. Four deep groundwater monitoring wells (GAGW-01, GAGW-02, GAGW-03, and GAGW-05) and one shallow well (GAGW-06I) were installed at the site. Two deep wells (GAGW-07 and GAGW-08) and a deep background well (GAGW-04D) were installed on adjoining properties. Details of these wells are summarized in Attachment 8. Monitoring well locations are shown on Attachment 9.

9.2.2 NAPL (Historical and Current) Presence

By 1982, approximately 80,000 gallons of LNAPL (3 to 7 feet thick) were floating on shallow, unconfined groundwater at the site. Up to 143 ppm of PCBs were detected in samples collected from the plume (Harrington 1997; Golder 2005b). The LNAPL plume extended off site to the south. At the time of the RI, LNAPL had not been detected in monitoring wells GAL-27, GAL-28, or MW-9, located on the RAD I property to the south of the railroad ROW (LMS 1990; EDR 2010; Golder 2005b).

Samples were collected from the LNAPL surface and intervals below the surface in November 2003 and again in August 2004. Samples were analyzed for VOCs, SVOCs, PCBs,

metals, total petroleum hydrocarbon (diesel range organics/gasoline range organics/mineral oil range organics [DRO/GRO/MRO]) gas chromatograph fingerprint, and physiochemical parameters. Selected results are summarized in the following table. LNAPL physical characteristics and a contour map of LNAPL viscosities are provided in Attachment 10. A contour map showing the interpreted distribution of total VOCs and benzene, toluene, ethylbenzene, and xylenes (BTEX) in LNAPL is provided as Attachment 11.

Analyte	Units	Minimum LNAPL Concentration	Maximum LNAPL Concentration
VOCs			
Benzene	mg/kg	ND	29
Cyclohexane	mg/kg	ND	160
Toluene	mg/kg	ND	1,800
Xylene (Total)	mg/kg	ND	1,400
Ethylbenzene	mg/kg	ND	610
Isopropylbenzene	mg/kg	ND	800
Methyl Cyclohexane	mg/kg	ND	540
CVOCs			
1,2-Dichlorobenzene	mg/kg	ND	120
PAHs			
Anthracene	mg/kg	ND	150
Benzo(a)anthracene	mg/kg	ND	610
Benzo(a)pyrene	mg/kg	ND	130
Chrysene	mg/kg	ND	720
Fluorene	mg/kg	ND	93
Napthalene	mg/kg	ND	520
Phenanthrene	mg/kg	ND	480
Pyrene	mg/kg	40	400
PCBs			
Total PCBs (Aroclor 1242, 1260)	mg/kg	ND	88
Metals			
Aluminum	mg/kg	ND	103
Arsenic	mg/kg	ND	12.6
Barium	mg/kg	ND	33.9
Chromium	mg/kg	0.28	6.2
Copper	mg/kg	ND	1.5

Analyte	Units	Minimum LNAPL Concentration	Maximum LNAPL Concentration
Iron	mg/kg	ND	361
Lead	mg/kg	ND	339
Manganese	mg/kg	ND	4.3
Vanadium	mg/kg	ND	7.5
Zinc	mg/kg	ND	60.7
TPH			
Total GRO	mg/kg	1,800	130,000
Total DRO	mg/kg	474,000	1,040,000
Total MRO	mg/kg	94,1000	509,000

Notes:
CVOC – chlorinated volatile organic compound
DRO – diesel range organic
GRO – gasoline range organic
LNAPL – light non-aqueous phase liquid
mg/kg – milligram per kilogram
MRO – mineral oil range organic
ND – not detected, detection limits not provided in source documents
PAH - polycyclic aromatic hydrocarbon
PCB – polychlorinated biphenyl
TPH – total petroleum hydrocarbon
VOC – volatile organic compound

The primary source of the LNAPL is the tank farm on the northeastern corner of the site. An additional LNAPL source is off-site LNAPL plume on the adjoining RAD I property. LNAPL originating from this source is more volatile and less viscous than the LNAPL originating from the site (Golder 2005b).

LNAPL recovery pilot systems were installed at the site in 2004 and 2008 and are discussed in Section 10. In the RI, Golder Associates concluded that the majority of the remaining LNAPL at the site was "stable and unrecoverable" due to high viscosity, low solubility, low gradients, source removal in the 1980s, and a transient groundwater mound that was identified off site to the south between the property and Newtown Creek (Golder 2005b).

9.2.3 Dissolved Contaminant Plume

Groundwater samples were collected at the site during the Phase II site investigations by Lawler, Matusky & Skelly Engineers and Phases I and II of the RI by Golder Associates.

Groundwater samples were collected from deep on-site monitoring wells (GAGW-01, GAGW-02, GAGW-03, and GAGW-05), shallow on-site monitoring wells (GAGW-06I), off-site deep monitoring wells (GAGW-07 and GAGW-08), and a deep background well (GAGW-04D) during the RI in January and August 2004 and analyzed for VOCs, SVOCs, PCBs, metals, and natural attenuation parameters. Monitoring well locations are shown on Attachment 9 (Golder 2005b).

Roehr Chemicals, Inc. (Roehr) is located approximately 900 feet north of the site at 52-20 37th Street (DAR Site ID #42). Roehr is a closed Resource Conservation and Recovery Act (RCRA) site. By 1991, investigations on the Roehr property indicated that on-site soil and groundwater were impacted by xylene and other contaminants. Groundwater flow is to the south-southwest toward the site. In November 2000, an off-site investigation was conducted by Roehr to identify impacts to downgradient properties, including the site (Golder 2005b).

Golder Associates compared results obtained from RI activities and those obtained by others prior to the RI to NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Class GA (groundwater) standards and guidance values. Groundwater concentrations that exceeded the standard are summarized in the following table and shown in Attachment 12 (Golder 2005b).

Analyte	Units	Minimum Groundwater Concentration	Maximum Groundwater Concentration
December 1988 and February 1990 sampling events during Phase II Site Investigation			
VOCs			
Benzene	µg/L	ND	6
Xylene (total)	µg/L	ND	25
CVOCs			
1,2-dichloroethene	µg/L	ND	3
1,2-dichloropropane	µg/L	ND	2
PAHs			
Benzo(a)pyrene	µg/L	ND	4
Benzp(a)fluoranthene	µg/L	ND	5
Benzo(k)fluoranthene	µg/L	ND	5
Benzo(a)anthracene	µg/L	ND	15

Analyte	Units	Minimum Groundwater Concentration	Maximum Groundwater Concentration
Chrysene	µg/L	ND	33
Metals			
Antimony	µg/L	NR	28.7
Iron	µg/L	NR	62,400
Manganese	µg/L	NR	2,550
Sodium	µg/L	NR	42,400
Vanadium	µg/L	NR	21.7
October 2000 sampling event at MW-1 and MW-7			
VOCs			
Benzene	µg/L	ND	1
Ethylbenzene	µg/L	ND	5
Xylenes	µg/L	ND	19
MTBE	µg/L	ND	170
CVOCs			
Cis-1,2-dichloroethene	µg/L	ND	210
Trichloroethylene	µg/L	ND	100
PAHs			
Benzo(a)pyrene	µg/L	ND	0.2
Benzo(a)anthracene	µg/L	ND	1
Chrysene	µg/L	ND	1
Metals			
Iron	µg/L	NR	39,300
Manganese	µg/L	NR	1,810
Sodium	µg/L	NR	200,000
Antimony	µg/L	NR	5.1
Arsenic	µg/L	NR	61.9
Copper	µg/L	NR	308
Lead	µg/L	NR	234
Magnesium	µg/L	NR	49,000
Sodium	µg/L	NR	226,000
Vanadium	µg/L	NR	24.3
November 2002 sampling event at MW-7R, MW-8, MW-9, MW-10, and MW-11			
VOCs			
Benzene	µg/L	NR	46.4
Ethylbenzene	µg/L	NR	90.3

Analyte	Units	Minimum Groundwater Concentration	Maximum Groundwater Concentration
Toluene	µg/L	NR	9
Xylene (total)	µg/L	NR	398
CVOCs			
Chloroform	µg/L	NR	17
2003 and 2004 sampling events during RI			
Shallow on-site well (GAGW-06I)			
VOCs			
Benzene	µg/L	ND	1.1
MTBE	µg/L	ND	33
CVOCs			
Cis-1,2-dichloroethene	µg/L	ND	5.1
Vinyl Chloride	µg/L	ND	2.1
Metals			
Iron	µg/L	ND	19,200
Manganese	µg/L	ND	1,110
Sodium	µg/L	ND	74,300
Deep on-site wells (GAGW-01, GAGW-02, GAGW-03, and GAGW-05)			
VOCs			
MTBE	µg/L	1.4	270
CVOCs			
Chloroform	µg/L	ND	7.9
Trichloroethene	µg/L	ND	17
PAHs			
Benzo(a)pyrene	µg/L	ND	0.3
Benzo(b)fluoranthene	µg/L	ND	0.3
Benzo(k)fluoranthene	µg/L	ND	0.4
Chrysene	µg/L	ND	0.3
Indeno(1,2,3-cd)pyrene	µg/L	ND	0.3
Metals			
Iron	µg/L	464	4,600
Magnesium	µg/L	46,300	66,600
Maganese	µg/L	753	807
Sodium	µg/L	92,800	205,000
Deep off-site wells (GAGW-07 and GAGW-08)			
VOCs			

Analyte	Units	Minimum Groundwater Concentration	Maximum Groundwater Concentration
MTBE	µg/L	150	240
CVOCs			
Trichloroethylene	µg/L	ND	21
Chloroform	µg/L	ND	7.9
Metals			
Iron	µg/L	NR	1,700
Magnesium	µg/L	48,000	63,1000
Sodium	µg/L	145,000	213,000

Notes:
µg/L – microgram per liter
CVOC – chlorinated volatile organic compounds
MTBE – methyl tert-butyl ether
ND – not detected, detection limits not provided in source documents
NR – not reported in source documents
PAH – polycyclic aromatic hydrocarbon
VOC – volatile organic compounds

During the RI, solute transport modeling was conducted. Maximum detected concentrations were used, and except for benzo(a)pyrene, no retardation was included in the modeling. The results indicated that by the time groundwater reached Newtown Creek concentrations were below surface water criteria (Golder 2005b).

9.2.4 Groundwater Summary

By 1982, approximately 80,000 gallons of LNAPL (3 to 7 feet thick) were floating on shallow groundwater at the site. The LNAPL plume extended off site to the south. At the time of the RI, LNAPL had not been detected in monitoring wells GAL-27, GAL-28, or MW-9, located on the RAD I site (Lot 279 and 280) to the south of the railroad ROW (LMS 1990; EDR 2010; Golder 2005b). Groundwater sampling and analysis conducted between 1988 and 2005 indicated that concentrations of some dissolved VOCs, PAHs, SVOCs, and metals in groundwater at the site exceed the NYSDEC TOGS 1.1.1 Class GA (groundwater) standards and guidance values (Golder 2005b).

9.3 Surface Water

Surface Water Investigation	☒ Yes	☐ No
SPDES Permit (Current or Past)	☐ Yes	☒ No
Industrial Wastewater Discharge Permit (Current or Past)	☐ Yes	☒ No
Stormwater Data	☐ Yes	☒ No
Catch Basin Solids Data	☐ Yes	☒ No
Wastewater Data	☒ Yes	☐ No

9.3.1 Surface Water Investigation

Surface water and sediment samples were collected from a historical lagoon located near the northwestern corner of the property in 1989 and 1990 during the Phase II site investigation. Sample locations are shown on Attachment 5. Approximately 4 feet of standing water and 2 to 3 inches of sediment were present in the lagoon at the time of the sampling. Samples were analyzed for PCBs, pesticides, SVOCs, VOCs, and metals. Results from these sampling events were not identified in documents available for review (LMS 1990).

9.3.2 Stormwater and Wastewater Systems

Historical documents indicate that the site discharged untreated stormwater and wastewater to Newtown Creek from at least the early 1930s until at least the early 1970s (Walter R. Ray Holdings Co., Inc. 1967; 37-80 Review 2005).

A water use survey completed by Triplex in 1959 indicates that the site had 1 million (unit assumed to be gallons but is not specified in source document) of lubricating oil on the premises and that on average four to six oil trucks were filled each day. The site discharged sanitary and boiler blowdown water to Newtown Creek and process water to a recycler. Runoff from the yard drained to three oil separators that discharged to the creek when it rained (Water Pollution Control Board 1959).

In 1971, the site signed an Order on Consent and agreed to abate discharge to Newtown Creek and to submit engineering plans for improvements to the site's existing drainage and sanitary sewer infrastructure (Diamond 1971; Newman 1971). The NYSDEC issued a construction permit to Newtown Refining in 1972 to construct a waste disposal system,

modify the existing oil separators, and install pipes to connect process waste to the municipal sewer. Upon completion of the construction activities, the site was required to apply for a permit to operate a treatment facility and discharge wastewater to the waters of New York State (NYSDEC 1972). No additional information about the discharge or site improvements was identified in documents available for review.

Schematic site plans created during site investigations conducted in the 1980s indicate that site runoff drained to catch basins or drainage sumps prior to being were pumped or flowing via gravity to a pump station on the western property boundary. Collected runoff from the pump station ultimately discharged to Newtown Creek via an 8-inch-diameter discharge pipe located 420 feet southwest of the southwestern corner of the site. Effluent sumps at the site appeared to discharge to on-site conveyance piping that connects to the municipal sanitary system in Review Avenue (see Attachment 1; LMS 1990). Information about the current on-site stormwater infrastructure (i.e., catch basins, conveyance piping, and treatment systems) was not identified in documents available for review.

Currently, the site is located in the Bowery Bay WPCP sewershed. Although wastewater discharges from the site flow into a separate local municipal system, it is likely that the separate local system flows into a larger combined system prior to reaching the treatment plant. When the combined flows exceed the system's capacity, untreated CSOs are discharged to Newtown Creek (NYCDEP 2007).

9.3.3 SPDES Permit

In 2008, the site submitted a State Pollution Elimination Discharge System (SPDES) permit equivalent application for the discharge of treated groundwater from the LNAPL recovery pilot study. The proposed system discharged treated groundwater onto the ground surface in the center of the site through infiltration piping (Kampf 2008). NYSDEC approved the application with the stipulation that discharge was not authorized until engineering plans demonstrating the method of treatment were submitted to and approved by NYSDEC. If plans were not approved within 6 months, the authorization would expire. Effluent limitations are summarized in the following table (Occidental 2008). Additional information about the permit and the pilot studies was not identified in documents available for review.

Permit Type	Permit Number	Effective Date	Outfalls	Volume	Frequency-Parameters (Limit)
SPDES Equivalent	-	Test A: 08/26/08 Test B: 09/03/08 Test C: 11/18/08 End date: 11/28/08	Outfall 001 – Treated Groundwater Remediation Discharge	Daily maximum 4,320 gallons per day	Continuous, Flow
					Weekly, pH (between 6.5 and 8.5 SU)
					Weekly, Oil and Grease (15 mg/L)
					Weekly, Benzene (1.0 µg/L)
					Weekly, Chloroethane (5.0 µg/L)
					Weekly, 1,1-Dichloroethane (5.0 µg/L)
					Weekly, Methyl Cyclohexane (15 µg/L)
					Weekly, MTBE (135 µg/L)
					Weekly, Toluene (5.0 µg/L)
					Weekly, Trichloroethene (5.0 µg/L)
					Weekly, Vinyl Chloride (2.0 µg/L)
					Weekly, Xylene (5.0 µg/L)
					Weekly, Acenapthene (10 µg/L)
					Weekly, Athracene (10 µg/L)
					Weekly, Benzo(a)pyrene (0.6 µg/L)
					Weekly, Benzo(b)fluranthene (0.002 µg/L)
					Weekly, Benzo(g,h,i)perylene (6.0 µg/L)
					Weekly, Benzo(k)fluoranthene (0.002 µg/L)
					Weekly, Chrysene (5.0 µg/L)
					Weekly, Flouranthene (0.002 µg/L)
					Weekly, Indeno(1,2,3-ed)pyene (10 µg/L)
					Weekly, 2-Methylenapthalene (0.002 µg/L)
					Weekly, Napthalene (0.5 µg/L)
					Weekly, Pentachlorophenol (10 µg/L)
					Weekly, Phenanthrene (10 µg/L)
					Weekly, Pyrene (10 µg/L)

Notes:
µg/L – microgram per liter
mg/L – milligram per liter
MTBE – methyl tert-butyl ether
SPDES – State Pollutant Discharge Elimination System
SU – standard units

9.3.4 Surface Water Summary

The site discharged untreated stormwater and wastewater to Newtown Creek from at least the 1930s through to the early 1970s. In 1971, the site signed an Order on Consent agreeing to abate discharge to Newtown Creek and to improve the site's existing drainage and sanitary sewer infrastructure (Diamond 1971; Newman 1971). Schematic site plans created during site investigations conducted in the 1980s indicate that the site discharged wastewater (process and sanitary) to a municipal sewer located in Review Avenue and stormwater to Newtown Creek (LMS 1990; Golder 2005b).

In 2008, the site submitted an application for a SPDES equivalent permit for the discharge from a pilot LNAPL removal system. Available site records indicate that the application was accepted and the pilot studies occurred, but information about the sampling results or reporting associated with the SPDES equivalent permit was not found in available records (Kampf 2008; Occidental 2008). Additional information about the permit and the pilot studies was also not identified in documents available for review.

9.4 Sediment

Creek Sediment Data ☐ Yes ☒ No ☐ Not Applicable

Information about creek sediment data was not identified in documents available for review.

9.5 Air

Air Permit ☐ Yes ☒ No
Air Data ☒ Yes ☐ No

9.5.1 Ambient Air Monitoring

During the Phase I soil vapor investigation activities conducted at the site in 2008, background ambient air samples were collected at a height of 3.5 to 5 feet above ground surface. Detections are summarized as follows:

Analyte	Units	Minimum Ambient Air Concentration	Maximum Ambient Air Concentration
VOCs			
Toluene	ppbv	1.4	2.1
Xylene (total)	ppbv	NR	2.63
Benzene	ppbv	0.34	5.6
Ethylbenzene	ppbv	0.21	0.89
1,2,4 – Trimethylbenzene	ppbv	0.20	2.0
1,3,5 – Trimethylbenzene	ppbv	0.42	0.95
CVOCs			
Tetrachloroethene	ppbv	NR	0.50
Trichlorethene	ppbv	NR	0.70
Cis-1,2- Dichloroethene	ppbv	NR	0.54
Vinyl Chloride	ppbv	0.46	1.9

Notes:
CVOC – chlorinated volatile organic compounds
ppbv – parts per billion by volume
NR – not reported in source documents
VOC – volatile organic compounds

10 REMEDIATION HISTORY (INTERIM REMEDIAL MEASURES AND OTHER CLEANUPS)

During the 1982 Emergency Remedial Action, OHM (NYCDEP's contractor) removed more than 500,000 gallons of liquids and 900 cy of solids from the site. Materials removed from the site included recyclable oil, PCB oil, PCB sludge, a cyanide solution, and PCB-contaminated diesel fuel (Ott 1982; Golder 2005b).

A pilot LNAPL passive recovery system was installed on the site in March 2004 and operated from April to June. The system included two 275-gallon ASTs (and a secondary containment system) and a pneumatic LNAPL recovery pump. A specific gravity skimmer pump was installed in GAL-07 to pump LNAPL to the recovery tanks. Following the pilot study, a second study was conducted at GAL-02 in June and July. The initial LNAPL recovery rates at the two wells were 25 gallons per day (gpd; GAL-07) and 10 gpd (GAL-02). The 25-gpd rate quickly decreased to 10 gpd after a few days (Golder 2005b). In 2008, LNAPL recovery units with and without thermal enhancement were installed on RAD I and the site

(Mitchell and Stetkar 2008). No additional information about these systems was identified in documents available for review.

A PRAP was issued by NYSDEC in June 2006. The proposed remedy included LNAPL recovery via a combination of single phase, vacuum-enhanced and localized soil heating methods; demolition and removal of buildings, tanks, and equipment remaining at the site; and regrading, and covering the surface with concrete, pavement, or clean fill and long-term monitoring (NYSDEC 2006). The site was accepted into the BCP program in 2006. A ROD was signed on February 9, 2007. Historical aerial photographs indicate that several large vertical ASTs remained on the property until at least 2006. Construction activities can be seen in aerials from 2008 (Google Earth 1994-2010). No other information regarding the current status of cleanup activities was located in available documents.

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12 ATTACHMENTS

Figures

Figure 1 Site Vicinity Map: Quanta Resources

Tables

Table 1 Potential Areas of Concern and Transport Pathways Assessment

Supplemental Attachments

Attachment 1 Figure 3: Layout of Quanta Resources Site Prior to Removal Action (Golder 2005b)

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Attachment 3 Figure 13: Conceptual Hydrogeologic Model (Golder 2005b)

Attachment 4 Figure 7: Interpreted Groundwater Contour Map (Golder 2005b)

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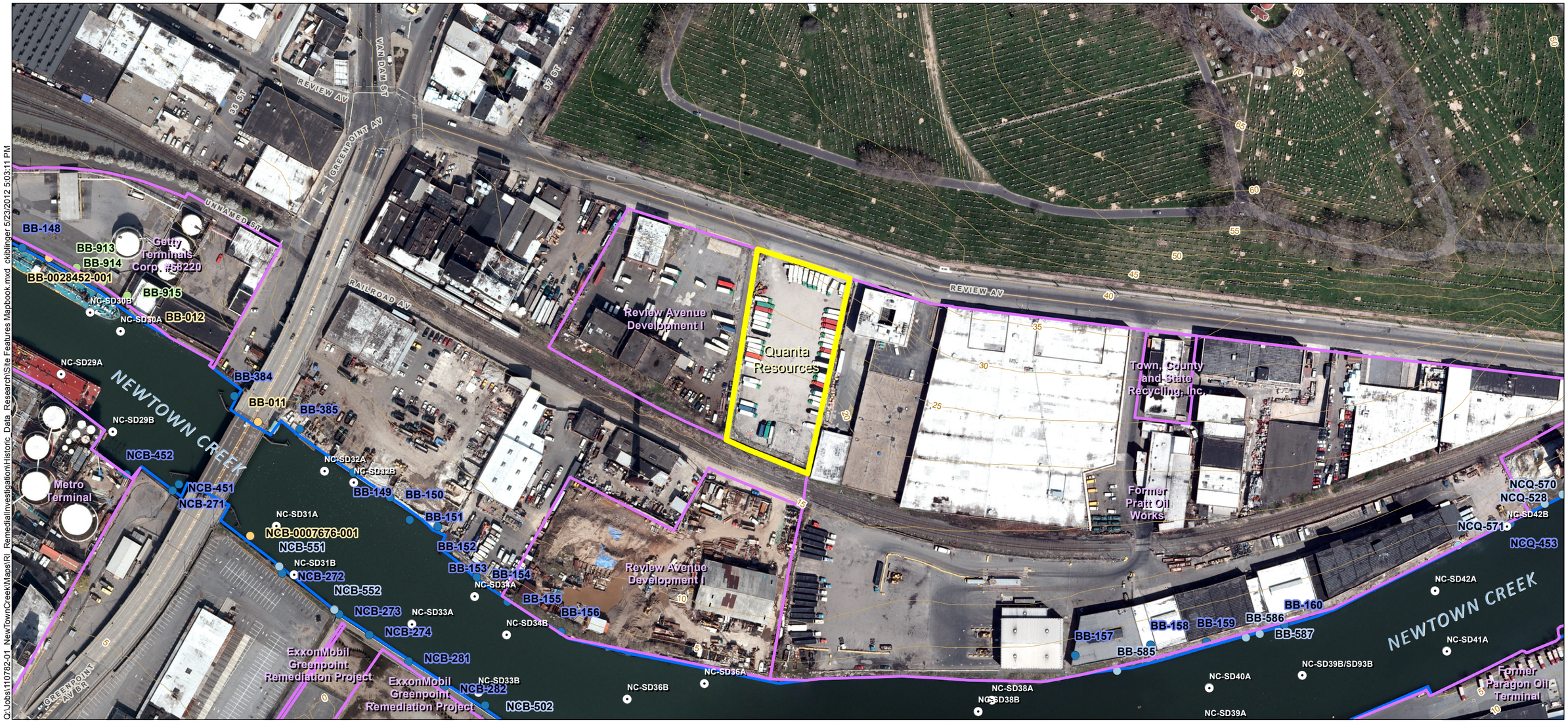
Table 1

Potential Areas of Concern and Transport Pathways Assessment – Quanta Resources A/K/A Review Ave. Development II

Potential Areas of Concern	Media Impacted					COPCs														Potential Complete Pathway						
						TPH			VOCs																		
Description of Areas of Concern	Surface Soil	Subsurface Soil	Groundwater	Catch Basin Solids	Creek Sediment	Gasoline-Range	Diesel – Range	Heavier – Range	Petroleum Related (e.g., BTEX)	VOCs	Chlorinated VOCs	SVOCs	PAHs	Phthalates	Phenolics	Metals	PCBs	Herbicides and Pesticides	Dioxins/Furans	Overland Transport	Groundwater	Direct Discharge – Overwater	Direct Discharge – Storm/Wastewater	Discharge to Sewer/CSO	Bank Erosion	Air Releases
On-site LNAPL Plume	?	√	√	?	?	?	?	?	√	√	?	?	√	?	?	√	√	?	?	?	?	?	?	?	?	?
Tank farm on northeastern portion of the property	?	√	√	?	?	?	?	?	√	√	?	?	√	?	?	√	√	?	?	?	?	?	?	?	?	?
Drippings, leaks from on-site equipment, loading/unloading trucks (1931 – 1982)	?	√	√	?	?	?	?	?	√	√	?	?	√	?	?	√	?	?	?	?	?	?	?	?	?	?
LNAPL plume northern adjoining property	?	?	√	?	?	?	?	?	√	√	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Dissolved plume from Roehr Property	?	?	?	?	?	?	?	?	?	√	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Overwater product transfer via pipeline(s) extending from site to docks (via easement) to vessels, barges, or other carriers	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
On-site waste disposal	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
On-site operations including oil recycling, disposal and re-refining, processing and storage of waste lubricating oil	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Discharge of wastes to the municipal sewer	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	√	?	?
Open-diked containment areas, open drums, and vats and metal tanks in poor condition, on-site lagoon	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Oil water separator and boiler blowdown discharges	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	√	?	?	?

Notes:
√ – COPCs are/were present in areas of concern having a current or historical pathway that is determined to be complete or potentially complete.
? – There is not enough information to determine if COPC is/was present in area of concern or if pathway is complete.
-- – Current or historical pathway has been investigated and shown to be not present or incomplete.

BTEX – benzene, toluene, ethylbenzene, and xylenes
COPC – constituent of potential concern
CSO – combined sewer overflow
LNAPL – light nonaqueous phase liquid
PAH – polycyclic aromatic hydrocarbon
PCB – polychlorinated biphenyl
SVOC – semi-volatile organic compound
TPH – total petroleum hydrocarbon
VOC – volatile organic compound



- USEPA Sample Locations (Surface and Subsurface)
- Shoreline (NYC Dept. of Information Technology, 2006)
- USGS Nat'l Elev. Dataset 5-foot Contours
- Selected Site Property Boundary
- Neighboring Site Property Boundary

Outfall Class

- Direct Discharge
- General
- Highway Drain
- Major Stormwater Outfall
- SPDES
- Storm Drain

NOTES:

1. Outfall Labeling: BB: Bowery Bay; NC(B/Q): Newtown Creek, Brooklyn/Queens; ST: Stormwater.
2. Outfall locations are preliminary, compiled, estimated data based on New York City Department of Environmental Protection (NYCDEP) maps and tabulated data and other resources. Many outfall locations were taken from the New York City Shoreline Survey Program: Newtown Creek Water Pollution Control Plant Drainage Area, NYCDEP, March 31, 2003. Other locations were taken from an excerpt from a similar report from 2008 (the complete report was not included in files available for review). Finally, some outfall locations were inherited from previous Anchor QEA and Newtown Creek Project work. Latitudinal and longitudinal data provided in the 2003 and 2008 NYCDEP reports were rounded to the nearest second. This resulted in potential outfall location discrepancies of up to approximately 200 feet. All outfall locations are currently under field verification.
3. Aerial Photos: New York State Division of Homeland Security and Emergency Services, 2010.
4. Site Boundaries are based on New York City parcels data.
5. Coarse topographic contours are derived from U.S. Geological Survey 10-meter data.

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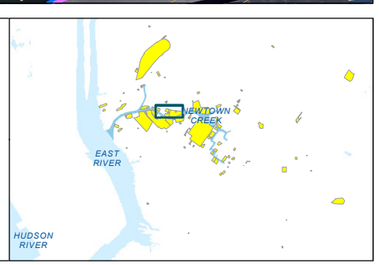

ANCHOR QEA

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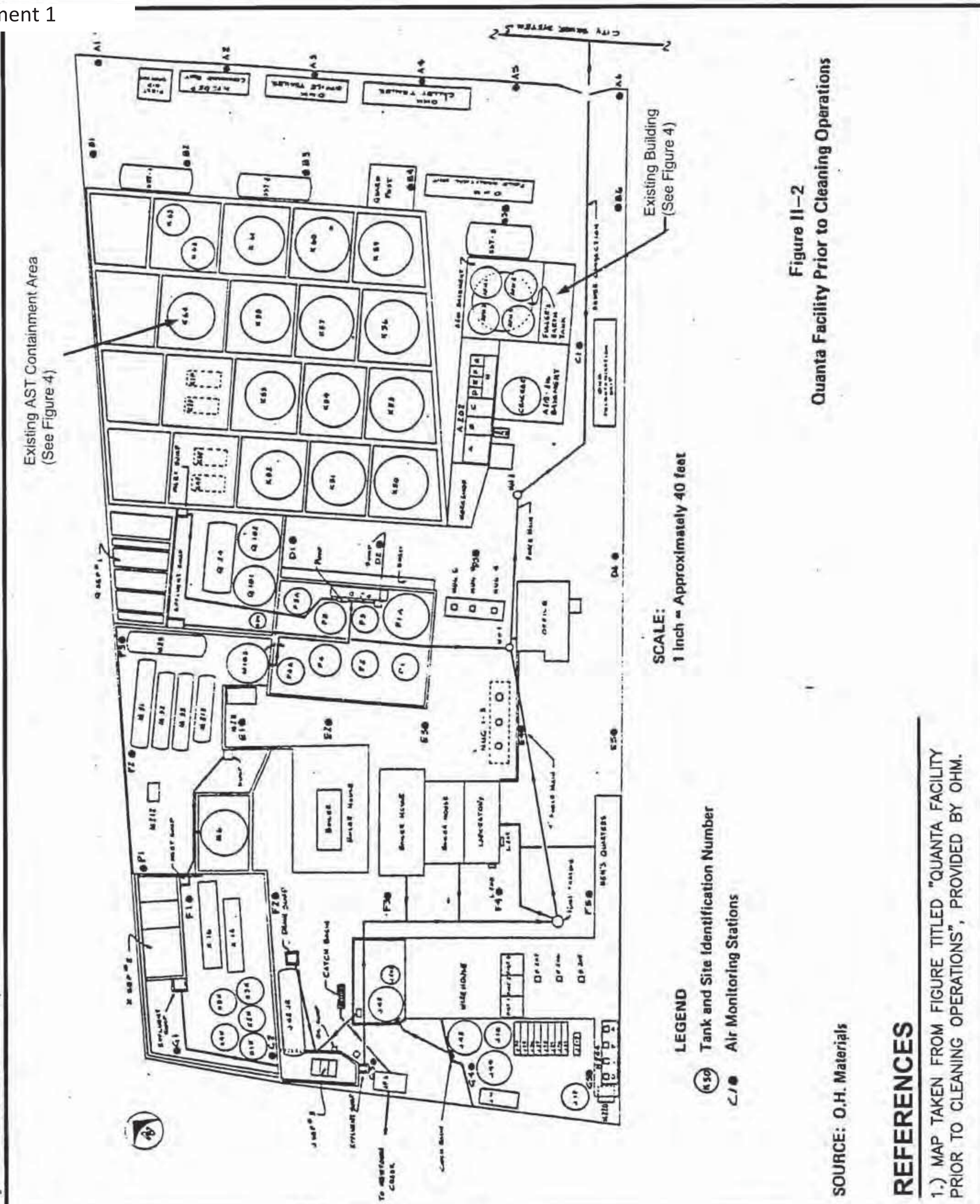
Figure 1
Site Vicinity Map
Draft Upland Site Summary: Quanta Resources
Newtown Creek RI/FS

SUPPLEMENTAL ATTACHMENTS

Attachment 1



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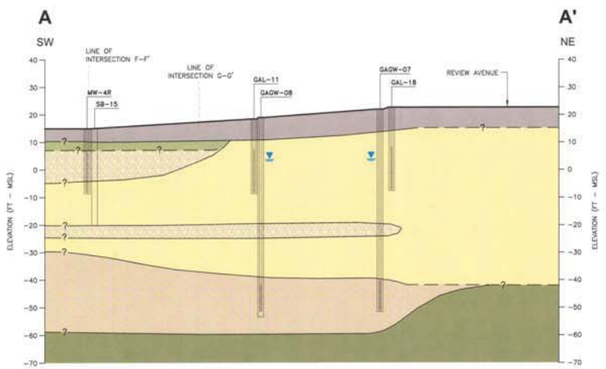
Attachment 2



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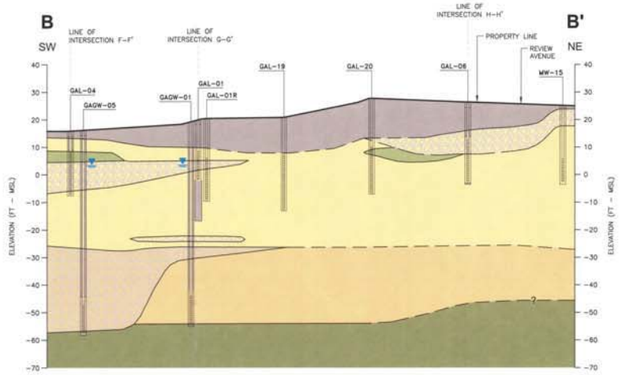

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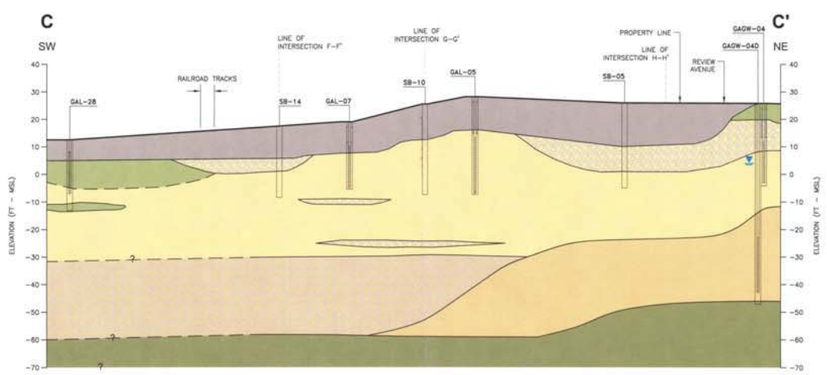

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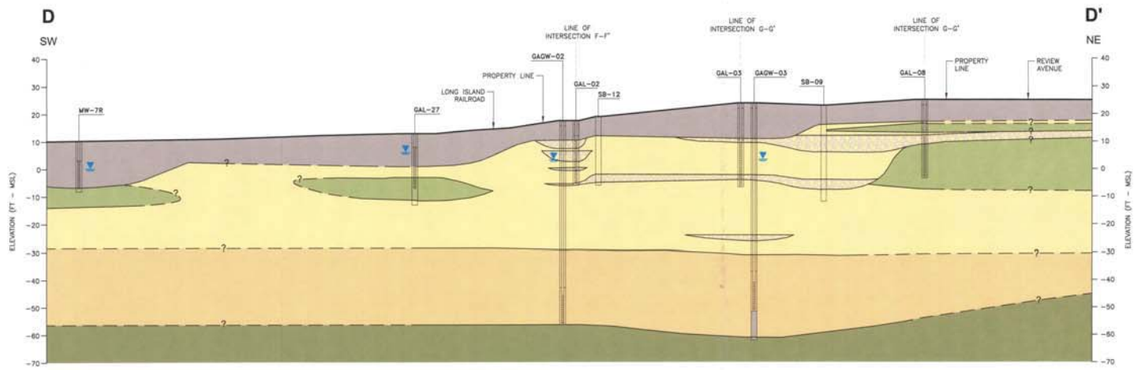

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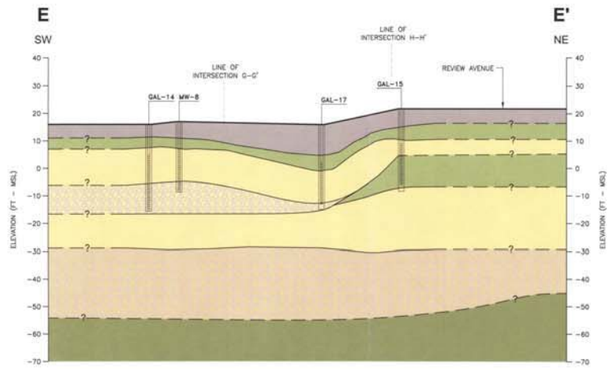

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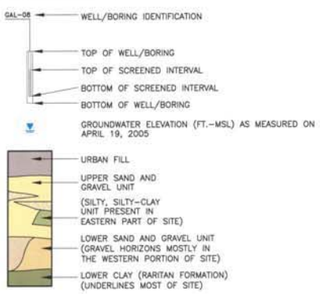


NOTES

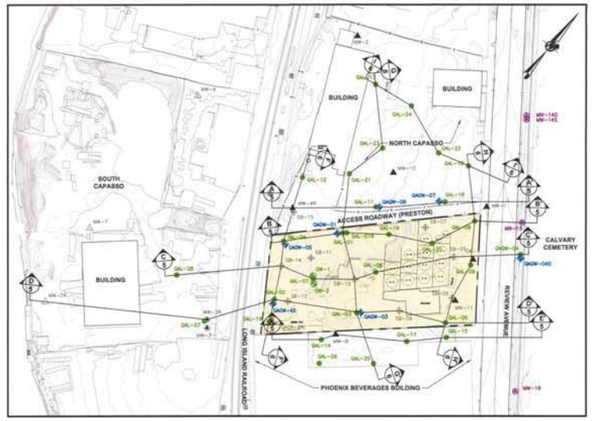
1.) SUBSURFACE INFORMATION OBTAINED DURING THE REMEDIAL INVESTIGATION SUPPLEMENTED WITH BOREHOLE INFORMATION OBTAINED FROM PREVIOUS INVESTIGATION BY HALEY AND ALDRICH (MONITORING WELLS MW-3R, MW-4R, MW-7R, MW-8 AND MW-11).

2.) INTERPRETED BOUNDARIES AND VERTICAL EXTENT ARE APPROXIMATE.

REFERENCES

1.) BASE MAP TAKEN FROM DIGITAL FILE 2148.DWG, ENTITLED TOPOGRAPHIC SURVEY OF QUANTA RESOURCES SUPERFUND SITE, LONG ISLAND CITY, NY, PROVIDED BY GEOD CORPORATION, DATED JANUARY 11, 2004.

2.) WELL COORDINATES TAKEN FROM A MICROSOFT EXCEL FILE Quanta Samples and Wells.xls, 2148A 8-23-04.xls AND 2148A 4-11-05.xls, PROVIDED BY GEOD CORP.



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VERTICAL SCALE FEET

VERTICAL EXAGGERATION X2.5

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PROJECT
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FEASIBILITY STUDY REPORT
QUEENS COUNTY, NEW YORK

TITLE
GENERALIZED GEOLOGIC CROSS SECTIONS A-A', THROUGH E-E'

Golder Associates
Philadelphia USA

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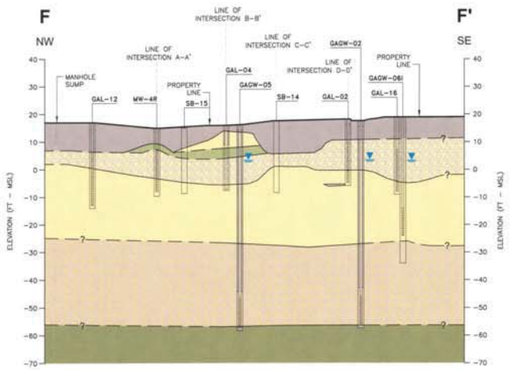
REVIEW	RSW	07/01/05			

FIGURE 5

Attachment 2



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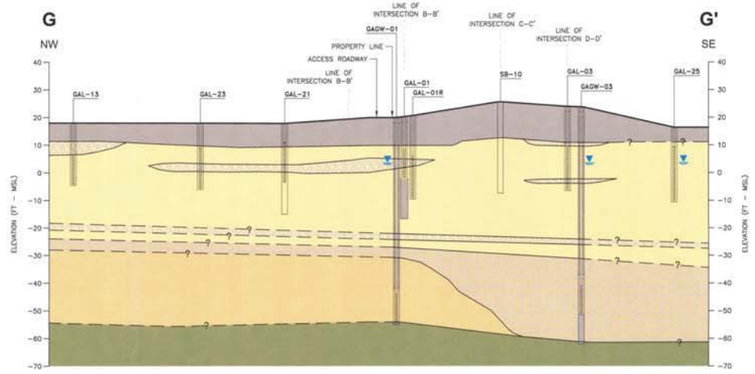

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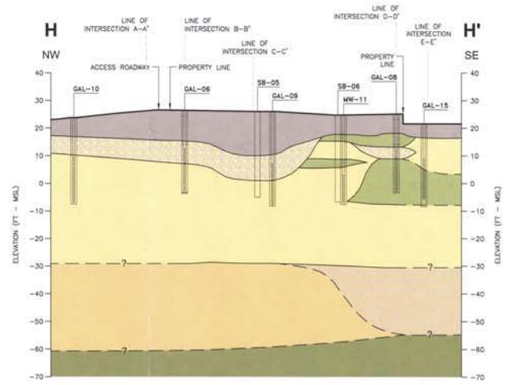

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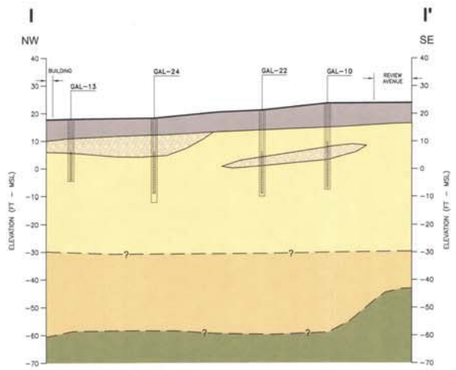

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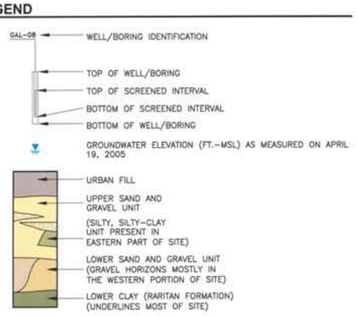

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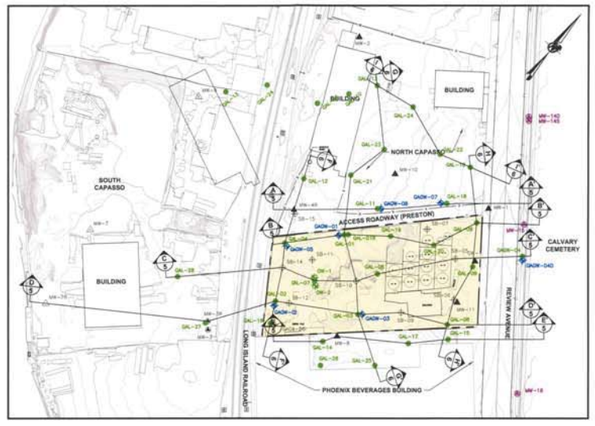

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VERTICAL EXAGGERATION X2.5

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT
QUANTA RESOURCES SITE
FEASIBILITY STUDY REPORT
QUEENS COUNTY, NEW YORK

TITLE
GENERALIZED GEOLOGIC CROSS SECTIONS F-F' THROUGH I-I'

Golder Associates Philadelphia, USA

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FIGURE 6

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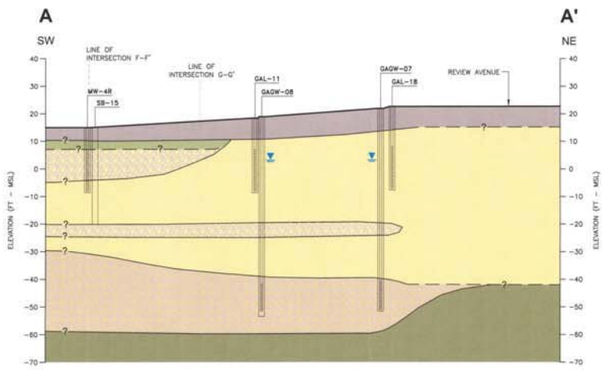

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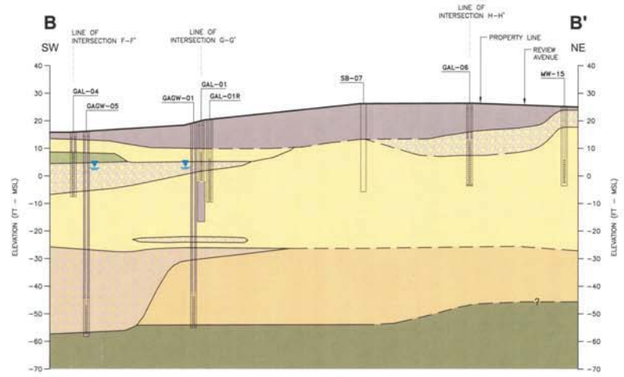

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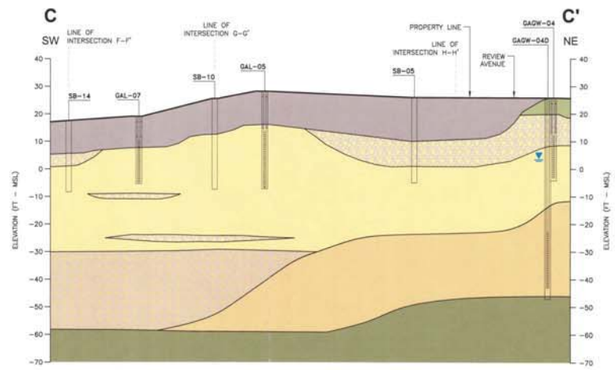

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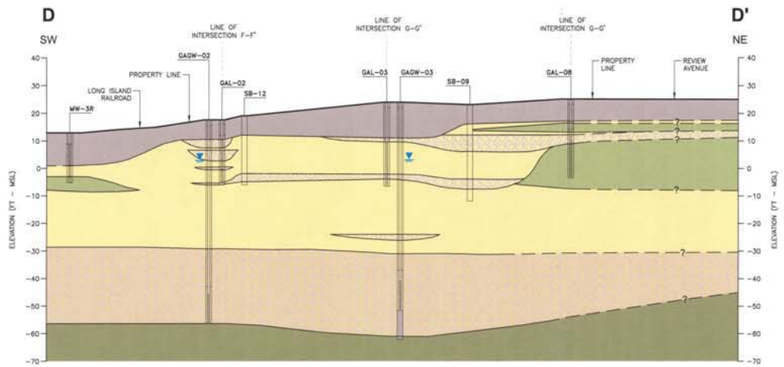

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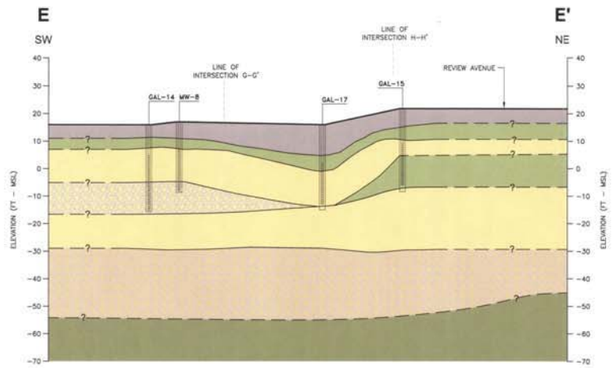

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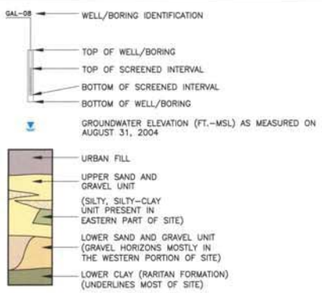

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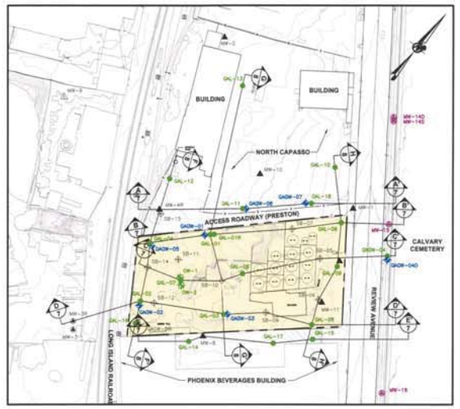

CROSS SECTION LOCATION MAP

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SCALE FEET

50 0 50 100
HORIZONTAL SCALE FEET

20 0 20 40
VERTICAL SCALE FEET

VERTICAL EXAGGERATION X2.5

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

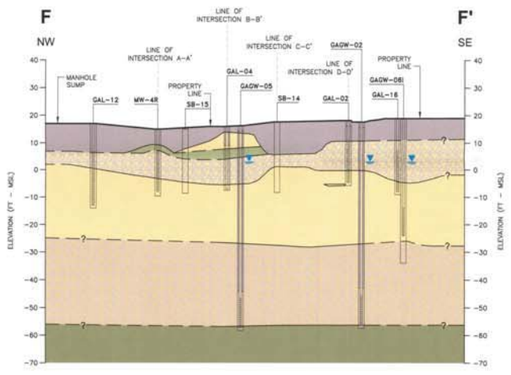
PROJECT
QUANTA RESOURCES SITE
DATA SUMMARY REPORT
QUEENS, NEW YORK

TITLE
GENERALIZED GEOLOGIC CROSS SECTIONS A-A', THROUGH E-E'

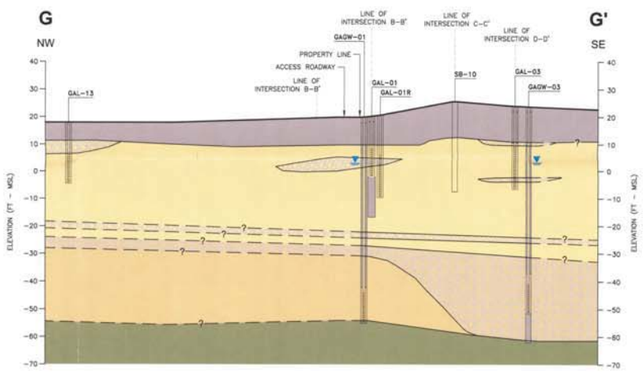
Golder Associates Philadelphia USA

PROJECT No.	023-6151	FILE No.	0236151K016
DESIGN	FG	11/15/04	SCALE AS SHOWN REV. 0
CADD	RG	01/14/05	
CHECK	SDM	01/14/05	FIGURE 7
REVIEW	RSW	01/14/05	

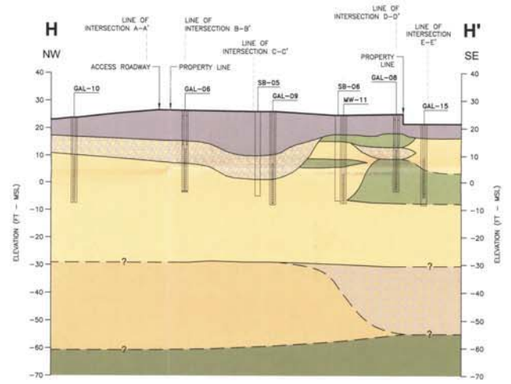
Attachment 2



F/8 CROSS SECTION F-F'

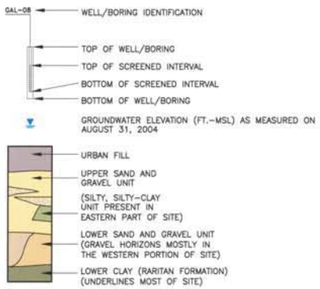


G/8 CROSS SECTION G-G'



H/8 CROSS SECTION H-H'

LEGEND



NOTES

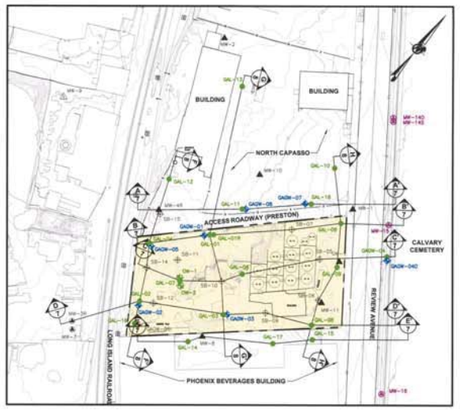
1.) SUBSURFACE INFORMATION OBTAINED DURING THE PHASE I REMEDIAL INVESTIGATION SUPPLEMENTED WITH BOREHOLE INFORMATION OBTAINED FROM PREVIOUS INVESTIGATION BY HALEY AND ALDRICH (MONITORING WELLS MW-3R, MW-4R, MW-8 AND MW-11).

2.) INTERPRETED BOUNDARIES AND VERTICAL EXTENT ARE APPROXIMATE.

REFERENCES

1.) BASE MAP TAKEN FROM DIGITAL FILE 2148.DWG, ENTITLED TOPOGRAPHIC SURVEY OF QUANTA RESOURCES SUPERFUND SITE, LONG ISLAND CITY, NY, PROVIDED BY GEOD CORPORATION, DATED JANUARY 11, 2004.

2.) WELL COORDINATES TAKEN FROM A MICROSOFT EXCEL FILE QUANTA SAMPLES AND WELLS.XLS AND 2148A 8-23-04.XLS, PROVIDED BY GEOD CORP.



CROSS SECTION LOCATION MAP

100 0 100
SCALE FEET

50 0 50 100
HORIZONTAL SCALE FEET

20 0 20 40
VERTICAL SCALE FEET

VERTICAL EXAGGERATION X2.5

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT
QUANTA RESOURCES
DATA SUMMARY REPORT
QUEENS, NEW YORK

TITLE
GENERALIZED GEOLOGIC CROSS SECTIONS F-F' THROUGH H-H'

Golder Associates
Philadelphia, USA

PROJECT No.		023-6151	FILE No.		0236151K022
DESIGN	FG	11/15/04	SCALE	AS SHOWN	REV. 0
CADD	RG	01/14/05			
CHECK	SDM	01/14/05			
REVIEW	RSW	01/14/05			

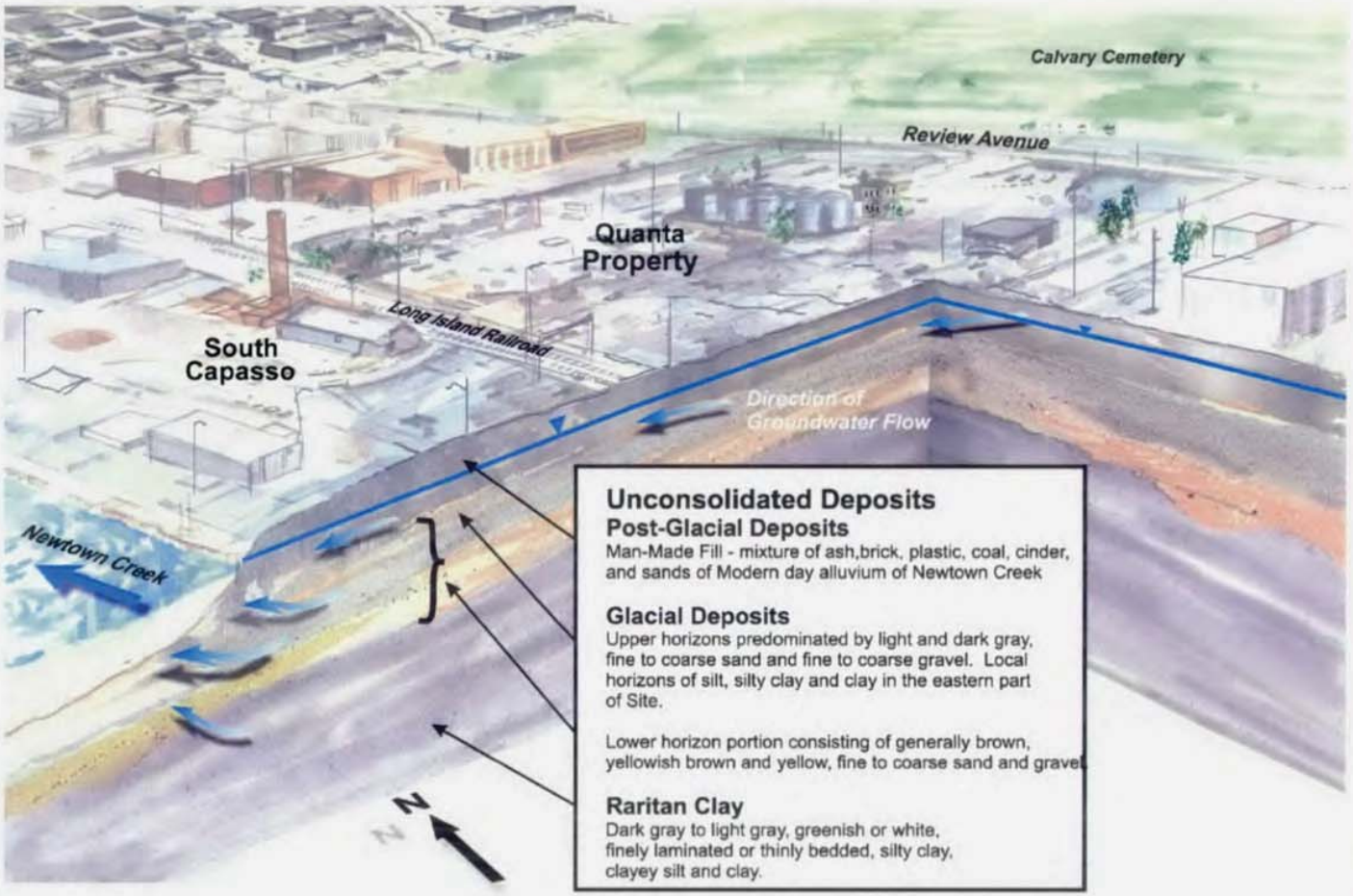
FIGURE 8

Attachment 3

NYSDEC001448

Drawing file: 0236151M018.dwg Jun 20, 2005 – 2:44pm

CONCEPTUAL SITE HYDROGEOLOGIC MODEL



Unconsolidated Deposits

Post-Glacial Deposits
Man-Made Fill - mixture of ash,brick, plastic, coal, cinder, and sands of Modern day alluvium of Newtown Creek

Glacial Deposits
Upper horizons predominated by light and dark gray, fine to coarse sand and fine to coarse gravel. Local horizons of silt, silty clay and clay in the eastern part of Site.

Lower horizon portion consisting of generally brown, yellowish brown and yellow, fine to coarse sand and gravel

Raritan Clay
Dark gray to light gray, greenish or white, finely laminated or thinly bedded, silty clay, clayey silt and clay.

FIGURE 13

PROJECT No.	023-6151	
FILE No.	0236151M018	
REV. 0	SCALE AS SHOWN	
DESIGN	RV	06/01/05
CADD	AM	06/20/05
CHECK	SDM	06/20/05
REVIEW	RSW	06/20/05

TITLE

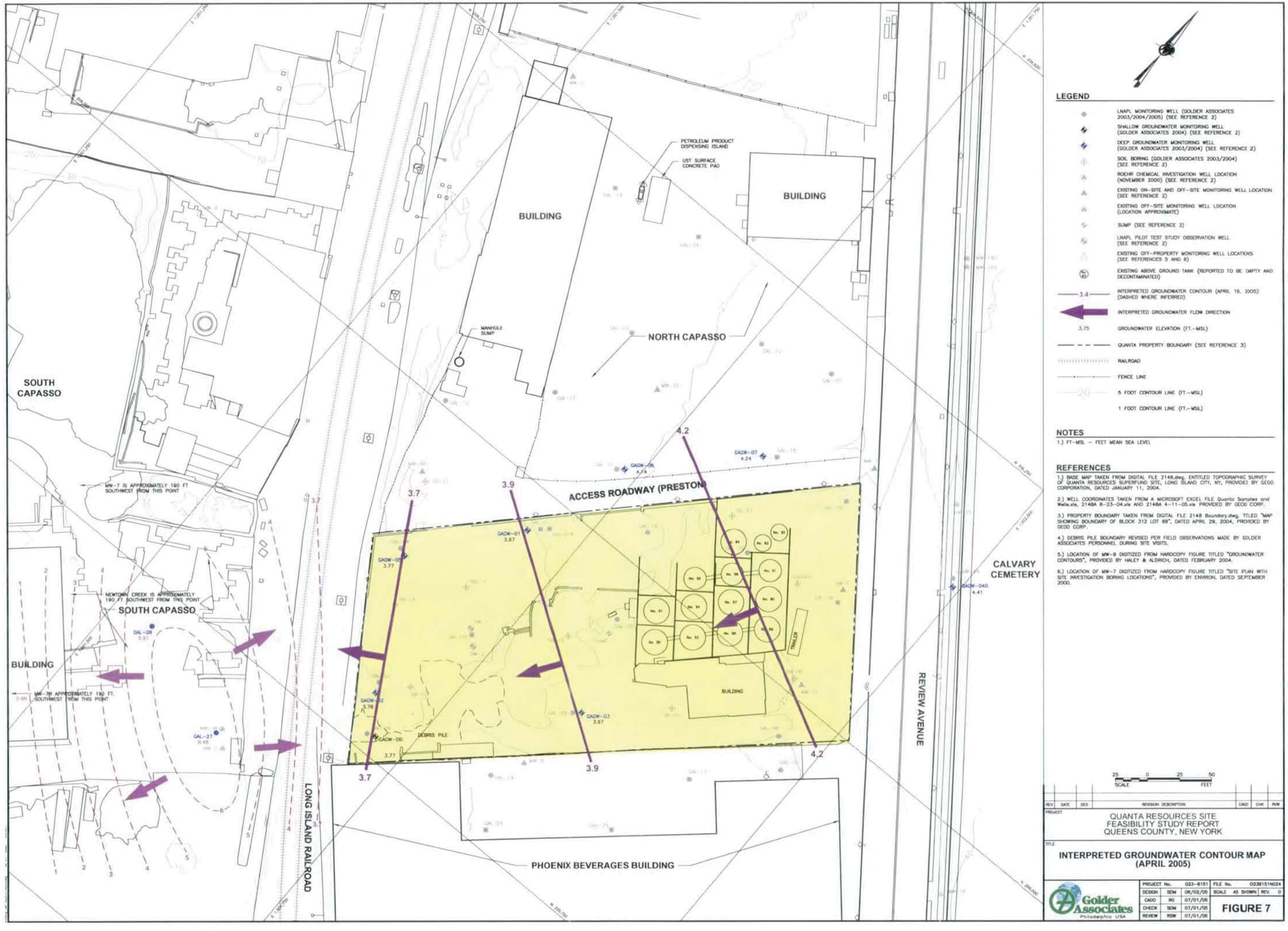
CONCEPTUAL SITE HYDROGEOLOGIC MODEL

PROJECT

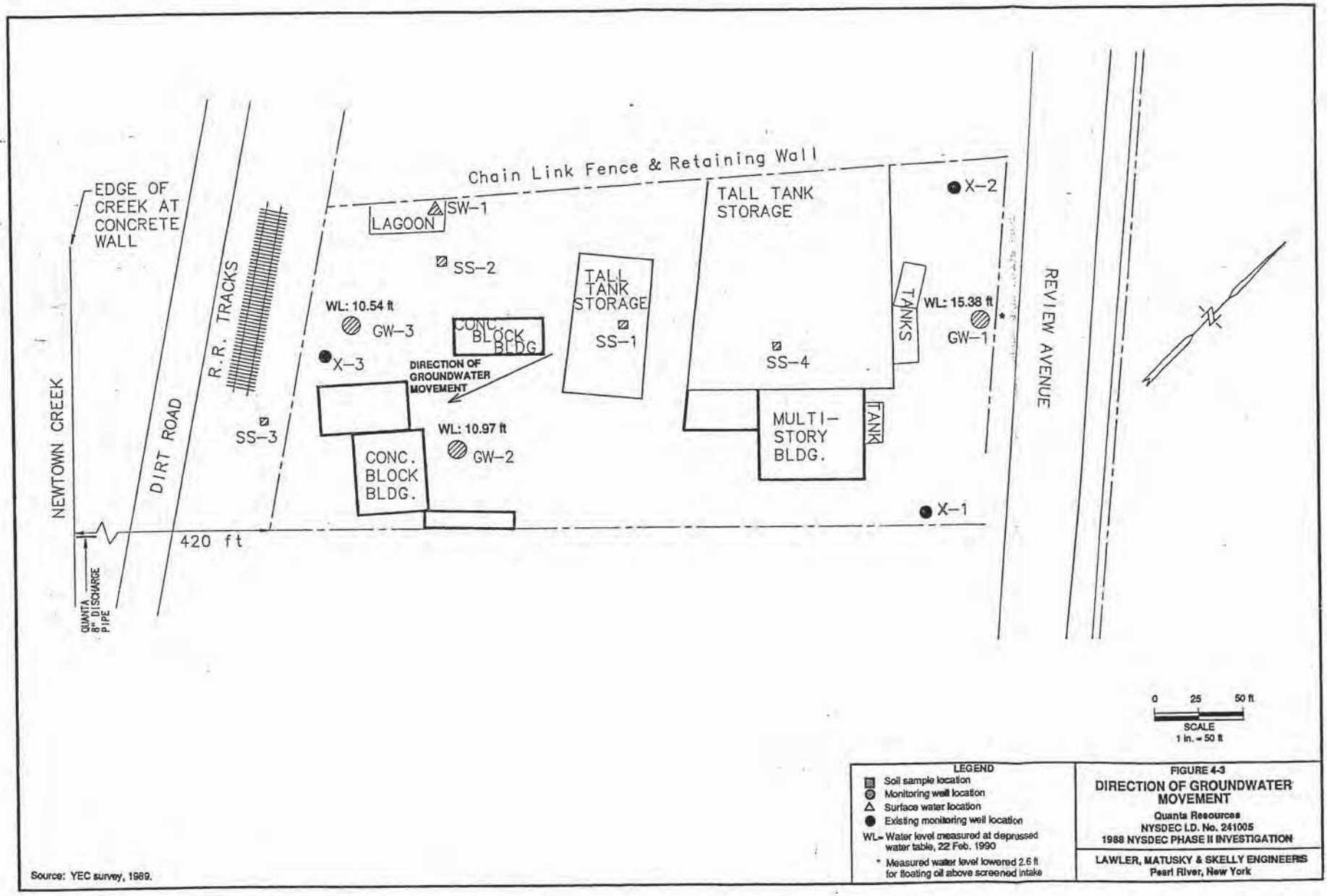
QUANTA RESOURCES SITE
REMEDIAL INVESTIGATION REPORT
QUEENS COUNTY, NEW YORK

Golder Associates
Philadelphia USA

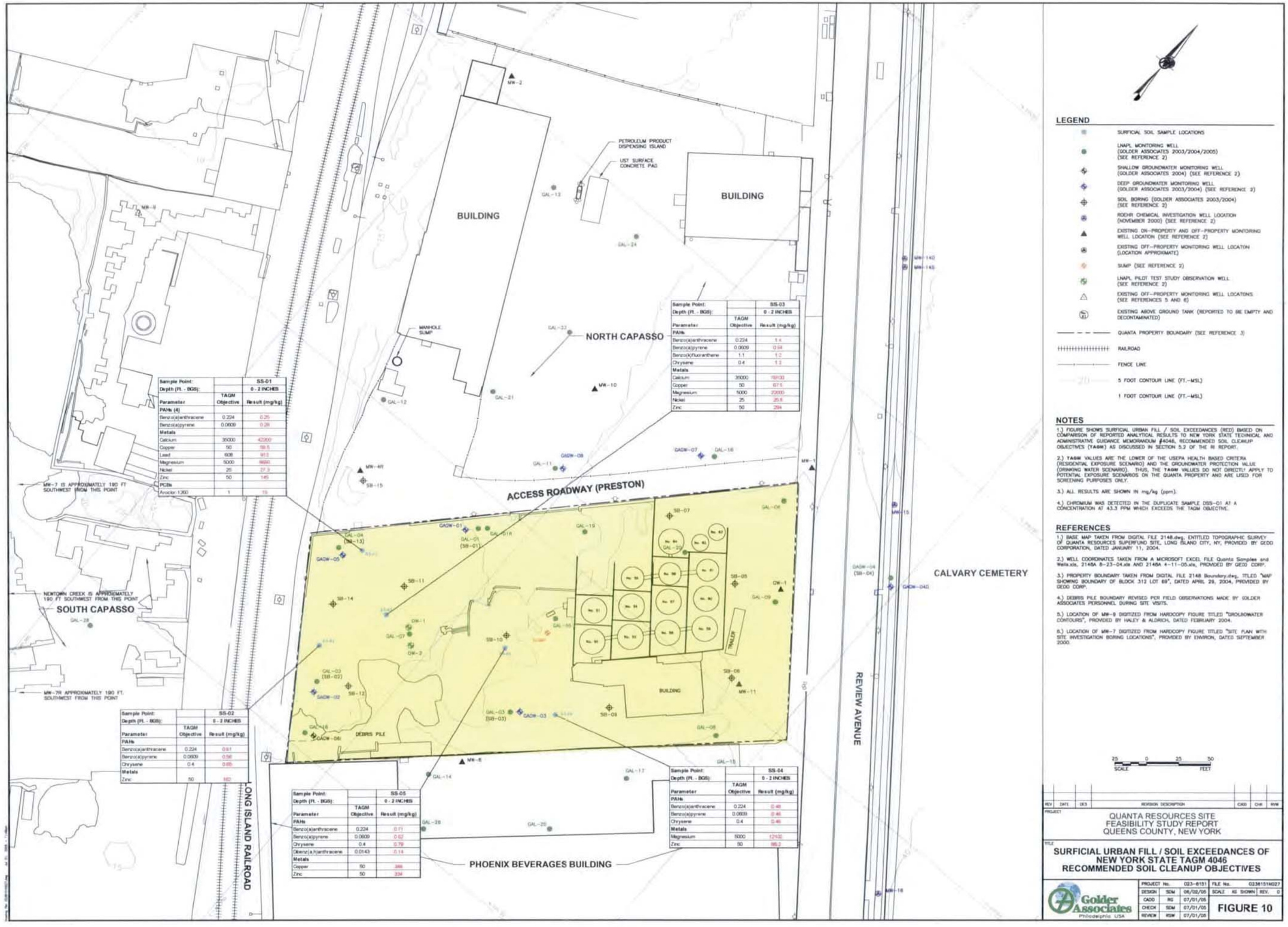
Attachment 4



Attachment 5



Attachment 6



Sample Point:		SS-01
Depth (Ft. - BGS):		0 - 2 INCHES
Parameter	TAGM Objective	Result (mg/kg)
PAHs (4)		
Benzo(a)anthracene	0.224	0.25
Benzo(a)pyrene	0.0609	0.28
Metals		
Calcium	35000	42300
Copper	50	59.5
Lead	608	913
Magnesium	5000	6690
Nickel	25	27.3
Zinc	50	145
PCBs		
Aroclor-1260	1	19

Sample Point:		SS-02
Depth (Ft. - BGS):		0 - 2 INCHES
Parameter	TAGM Objective	Result (mg/kg)
PAHs		
Benzo(a)anthracene	0.224	0.61
Benzo(a)pyrene	0.0609	0.56
Chrysene	0.4	0.65
Metals		
Zinc	50	162

Sample Point:		SS-03
Depth (Ft. - BGS):		0 - 2 INCHES
Parameter	TAGM Objective	Result (mg/kg)
PAHs		
Benzo(a)anthracene	0.224	1.4
Benzo(a)pyrene	0.0609	0.94
Benzo(k)fluoranthene	1.1	1.2
Chrysene	0.4	1.3
Metals		
Calcium	35000	59100
Copper	50	67.5
Magnesium	5000	23000
Nickel	25	25.8
Zinc	50	294

Sample Point:		SS-04
Depth (Ft. - BGS):		0 - 2 INCHES
Parameter	TAGM Objective	Result (mg/kg)
PAHs		
Benzo(a)anthracene	0.224	0.48
Benzo(a)pyrene	0.0609	0.46
Chrysene	0.4	0.46
Metals		
Magnesium	5000	12100
Zinc	50	86.2

Sample Point:		SS-05
Depth (Ft. - BGS):		0 - 2 INCHES
Parameter	TAGM Objective	Result (mg/kg)
PAHs		
Benzo(a)anthracene	0.224	0.71
Benzo(a)pyrene	0.0609	0.62
Chrysene	0.4	0.79
Dibenz(a,h)anthracene	0.0143	0.14
Metals		
Copper	50	386
Zinc	50	334

LEGEND

- SURFICIAL SOIL SAMPLE LOCATIONS
- LNAPL MONITORING WELL (GOLDER ASSOCIATES 2003/2004/2005) (SEE REFERENCE 2)
- SHALLOW GROUNDWATER MONITORING WELL (GOLDER ASSOCIATES 2004) (SEE REFERENCE 2)
- DEEP GROUNDWATER MONITORING WELL (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- SOIL BORING (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- ROCHR CHEMICAL INVESTIGATION WELL LOCATION (NOVEMBER 2000) (SEE REFERENCE 2)
- EXISTING ON-PROPERTY AND OFF-PROPERTY MONITORING WELL LOCATION (SEE REFERENCE 2)
- EXISTING OFF-PROPERTY MONITORING WELL LOCATON (LOCATION APPROXIMATE)
- SUMP (SEE REFERENCE 2)
- LNAPL PILOT TEST STUDY OBSERVATION WELL (SEE REFERENCE 2)
- EXISTING OFF-PROPERTY MONITORING WELL LOCATIONS (SEE REFERENCES 5 AND 6)
- EXISTING ABOVE GROUND TANK (REPORTED TO BE EMPTY AND DECONTAMINATED)
- QUANTA PROPERTY BOUNDARY (SEE REFERENCE 3)
- RAILROAD
- FENCE LINE
- 5 FOOT CONTOUR LINE (FT.-MSL)
- 1 FOOT CONTOUR LINE (FT.-MSL)

NOTES

1.) FIGURE SHOWS SURFICIAL URBAN FILL / SOIL EXCEEDANCES (RED) BASED ON COMPARISON OF REPORTED ANALYTICAL RESULTS TO NEW YORK STATE TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM #4046, RECOMMENDED SOIL CLEANUP OBJECTIVES (**TAGM**) AS DISCUSSED IN SECTION 5.2 OF THE RI REPORT.

2.) **TAGM** VALUES ARE THE LOWER OF THE USEPA HEALTH BASED CRITERIA (RESIDENTIAL EXPOSURE SCENARIO) AND THE GROUNDWATER PROTECTION VALUE (DRINKING WATER SCENARIO). THUS, THE **TAGM** VALUES DO NOT DIRECTLY APPLY TO POTENTIAL EXPOSURE SCENARIOS ON THE QUANTA PROPERTY AND ARE USED FOR SCREENING PURPOSES ONLY.

3.) ALL RESULTS ARE SHOWN IN mg/kg (ppm).

4.) CHROMIUM WAS DETECTED IN THE DUPLICATE SAMPLE DSS-01 AT A CONCENTRATION AT 43.3 PPM WHICH EXCEEDS THE TAGM OBJECTIVE.

REFERENCES

1.) BASE MAP TAKEN FROM DIGITAL FILE 2148.dwg, ENTITLED TOPOGRAPHIC SURVEY OF QUANTA RESOURCES SUPERFUND SITE, LONG ISLAND CITY, NY, PROVIDED BY GEDD CORPORATION, DATED JANUARY 11, 2004.

2.) WELL COORDINATES TAKEN FROM A MICROSOFT EXCEL FILE Quanta Samples and Wells.xls, 2148A 8-23-04.xls AND 2148A 4-11-05.xls, PROVIDED BY GEDD CORP.

3.) PROPERTY BOUNDARY TAKEN FROM DIGITAL FILE 2148 Boundary.dwg, TITLED "MAP SHOWING BOUNDARY OF BLOCK 312 LOT 69", DATED APRIL 29, 2004, PROVIDED BY GEDD CORP.

4.) DEBRIS PILE BOUNDARY REVISED PER FIELD OBSERVATIONS MADE BY GOLDER ASSOCIATES PERSONNEL DURING SITE VISITS.

5.) LOCATION OF MW-9 DIGITIZED FROM HARDCOPY FIGURE TITLED "GROUNDWATER CONTOURS", PROVIDED BY HALEY & ALDRICH, DATED FEBRUARY 2004.

6.) LOCATION OF MW-7 DIGITIZED FROM HARDCOPY FIGURE TITLED "SITE PLAN WITH SITE INVESTIGATION BORING LOCATIONS", PROVIDED BY ENVIRON, DATED SEPTEMBER 2000.

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	APP

PROJECT

QUANTA RESOURCES SITE
FEASIBILITY STUDY REPORT
QUEENS COUNTY, NEW YORK

TITLE

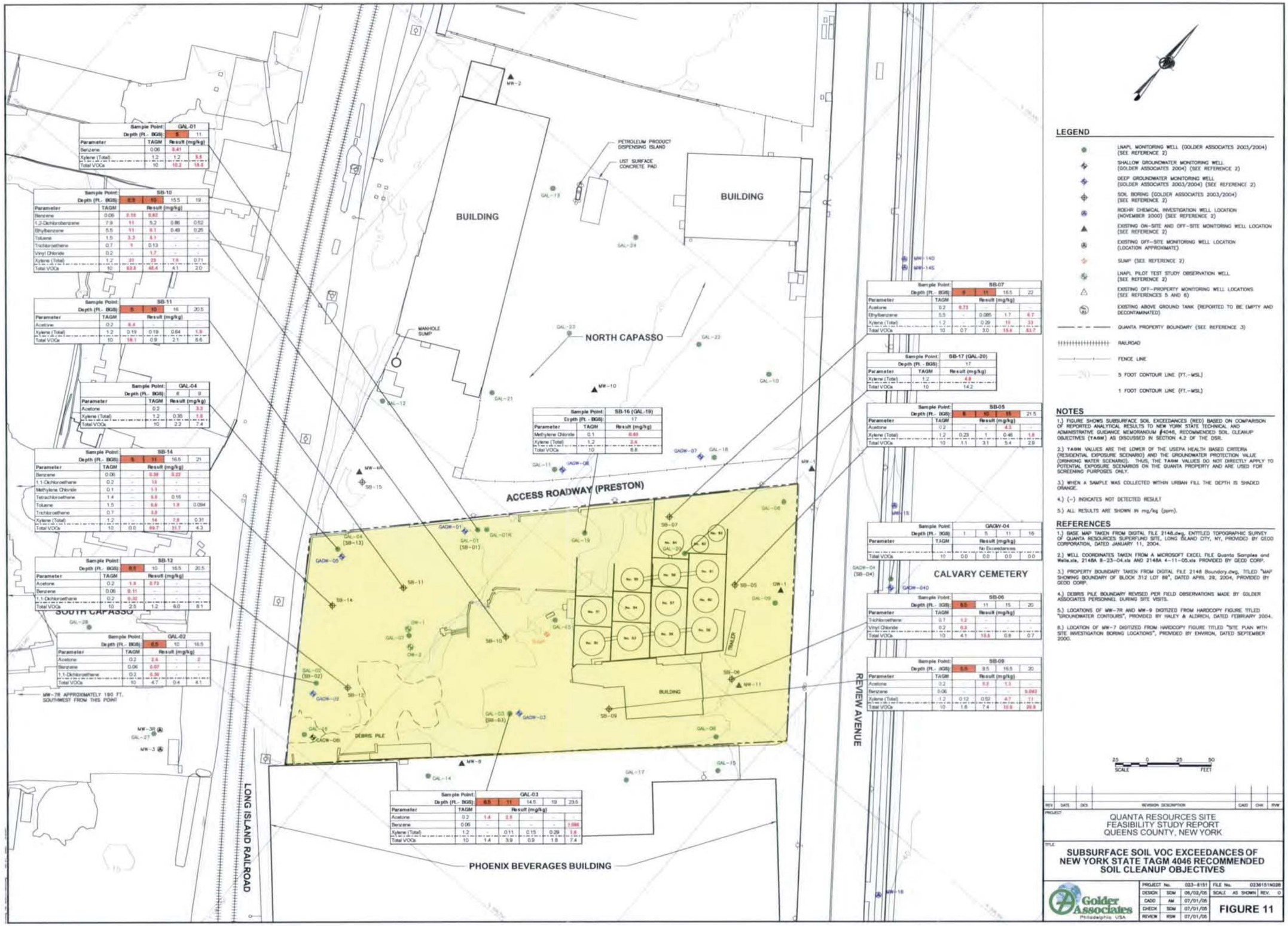
SURFICIAL URBAN FILL / SOIL EXCEEDANCES OF NEW YORK STATE TAGM 4046 RECOMMENDED SOIL CLEANUP OBJECTIVES

Golder Associates
Philadelphia, USA

PROJECT No.		023-6131	FILE No.	G3361116027	
DESIGN	SDM	06/02/05	SCALE	AS SHOWN	REV. 0
CADD	RG	07/01/05			
CHECK	SDM	07/01/05			
REVIEW	RSW	07/01/05			

FIGURE 10

Attachment 6



Sample Point		GAL-01		
Depth (Ft. - BGS)		5	11	
Parameter	TAGM	Result (mg/kg)		
Benzene	0.06	0.41	-	
Xylene (Total)	1.2	1.2	5.5	
Total VOCs	10	10.2	15.6	

Sample Point		SB-10			
Depth (Ft. - BGS)		6.5	10	15.5	19
Parameter	TAGM	Result (mg/kg)			
Benzene	0.06	0.10	0.83	-	-
1,2-Dichlorobenzene	7.9	11	5.2	0.86	0.52
Ethylbenzene	5.5	11	8.1	0.49	0.25
Toluene	1.5	3.3	8.1	-	-
Trichloroethene	0.7	1	0.13	-	-
Vinyl Chloride	0.2	-	1.7	-	-
Xylene (Total)	1.2	21	23	1.9	0.71
Total VOCs	10	53.5	48.4	4.1	2.0

Sample Point		SB-11			
Depth (Ft. - BGS)		5	10	16	20.5
Parameter	TAGM	Result (mg/kg)			
Acetone	0.2	0.4	-	-	-
Xylene (Total)	1.2	0.19	0.19	0.64	1.9
Total VOCs	10	16.1	0.9	2.1	6.6

Sample Point		GAL-04		
Depth (Ft. - BGS)		6	9	
Parameter	TAGM	Result (mg/kg)		
Acetone	0.2	-	3.3	
Xylene (Total)	1.2	0.35	1.8	
Total VOCs	10	2.2	7.4	

Sample Point		SB-14			
Depth (Ft. - BGS)		5	11	16.5	21
Parameter	TAGM	Result (mg/kg)			
Benzene	0.06	-	0.38	0.22	-
1,1-Dichloroethene	0.2	-	13	-	-
Methylene Chloride	0.1	-	1.1	-	-
Tetrachloroethene	1.4	-	5.8	0.15	-
Toluene	1.5	-	6.8	1.9	0.094
Trichloroethene	0.7	-	3.8	-	-
Xylene (Total)	1.2	-	14	7.8	0.31
Total VOCs	10	0.0	69.7	31.7	4.3

Sample Point		SB-12			
Depth (Ft. - BGS)		6.5	10	16.5	20.5
Parameter	TAGM	Result (mg/kg)			
Acetone	0.2	1.9	0.73	-	-
Benzene	0.06	0.11	-	-	-
1,1-Dichloroethene	0.2	0.32	-	-	-
Total VOCs	10	2.5	1.2	0.0	0.1

Sample Point		GAL-02		
Depth (Ft. - BGS)		4.5	10	16.5
Parameter	TAGM	Result (mg/kg)		
Acetone	0.2	2.4	-	2
Benzene	0.06	0.07	-	-
1,1-Dichloroethene	0.2	0.30	-	-
Total VOCs	10	4.7	0.4	4.1

Sample Point		SB-16 (GAL-19)
Depth (Ft. - BGS)		17
Parameter	TAGM	Result (mg/kg)
Methylene Chloride	0.1	0.83
Xylene (Total)	1.2	3.4
Total VOCs	10	8.8

Sample Point		GAL-03				
Depth (Ft. - BGS)		6.5	11	14.5	19	23.5
Parameter	TAGM	Result (mg/kg)				
Acetone	0.2	1.4	0.8	-	-	-
Benzene	0.06	-	-	-	-	1.000
Xylene (Total)	1.2	-	0.11	0.15	0.29	1.6
Total VOCs	10	1.4	3.9	0.9	1.9	7.4

Sample Point		SB-07			
Depth (Ft. - BGS)		6	11	16.5	22
Parameter	TAGM	Result (mg/kg)			
Acetone	0.2	0.73	-	-	-
Ethylbenzene	5.5	-	0.085	1.7	6.7
Xylene (Total)	1.2	-	0.29	15	33
Total VOCs	10	0.7	3.0	15.8	53.7

Sample Point		SB-17 (GAL-20)
Depth (Ft. - BGS)		17
Parameter	TAGM	Result (mg/kg)
Xylene (Total)	1.2	4.8
Total VOCs	10	14.2

Sample Point		SB-05			
Depth (Ft. - BGS)		6	10	15	21.5
Parameter	TAGM	Result (mg/kg)			
Acetone	0.2	-	-	4.3	-
Xylene (Total)	1.2	0.23	1	0.46	1.8
Total VOCs	10	1.1	3.1	5.4	2.9

Sample Point		GAGW-04			
Depth (Ft. - BGS)		1	5	11	16
Parameter	TAGM	Result (mg/kg)			
Total VOCs	10	No Exceedances			
		0.0	0.0	0.0	0.0

Sample Point		SB-06			
Depth (Ft. - BGS)		6.5	11	15	20
Parameter	TAGM	Result (mg/kg)			
Trichloroethene	0.7	1.2	-	-	-
Vinyl Chloride	0.2	0.3	-	-	-
Total VOCs	10	4.1	10.5	0.8	0.7

Sample Point		SB-09			
Depth (Ft. - BGS)		6.5	9.5	16.5	20
Parameter	TAGM	Result (mg/kg)			
Acetone	0.2	-	0.2	1.3	-
Benzene	0.06	-	-	-	0.062
Xylene (Total)	1.2	0.12	0.52	4.7	11
Total VOCs	10	1.6	7.4	10.8	26.8

LEGEND

- LNAPL MONITORING WELL (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- SHALLOW GROUNDWATER MONITORING WELL (GOLDER ASSOCIATES 2004) (SEE REFERENCE 2)
- DEEP GROUNDWATER MONITORING WELL (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- SOIL BORING (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- ROEHR CHEMICAL INVESTIGATION WELL LOCATION (NOVEMBER 2000) (SEE REFERENCE 2)
- EXISTING ON-SITE AND OFF-SITE MONITORING WELL LOCATION (SEE REFERENCE 2)
- EXISTING OFF-SITE MONITORING WELL LOCATION (LOCATION APPROXIMATE)
- SUMP (SEE REFERENCE 2)
- LNAPL PILOT TEST STUDY OBSERVATION WELL (SEE REFERENCE 2)
- EXISTING OFF-PROPERTY MONITORING WELL LOCATIONS (SEE REFERENCES 5 AND 6)
- EXISTING ABOVE GROUND TANK (REPORTED TO BE EMPTY AND DECONTAMINATED)
- QUANTA PROPERTY BOUNDARY (SEE REFERENCE 3)
- RAILROAD
- FENCE LINE
- 5 FOOT CONTOUR LINE (FT.-MSL)
- 1 FOOT CONTOUR LINE (FT.-MSL)

NOTES

1.) FIGURE SHOWS SUBSURFACE SOIL EXCEEDANCES (RED) BASED ON COMPARISON OF REPORTED ANALYTICAL RESULTS TO NEW YORK STATE TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM #4046, RECOMMENDED SOIL CLEANUP OBJECTIVES (TAGM) AS DISCUSSED IN SECTION 4.2 OF THE DSR.

2.) TAGM VALUES ARE THE LOWER OF THE USEPA HEALTH BASED CRITERIA (RESIDENTIAL EXPOSURE SCENARIO) AND THE GROUNDWATER PROTECTION VALUE (DRINKING WATER SCENARIO). THUS, THE TAGM VALUES DO NOT DIRECTLY APPLY TO POTENTIAL EXPOSURE SCENARIOS ON THE QUANTA PROPERTY AND ARE USED FOR SCREENING PURPOSES ONLY.

3.) WHEN A SAMPLE WAS COLLECTED WITHIN URBAN FILL THE DEPTH IS SHADED ORANGE.

4.) (-) INDICATES NOT DETECTED RESULT

5.) ALL RESULTS ARE SHOWN IN mg/kg (ppm).

REFERENCES

1.) BASE MAP TAKEN FROM DIGITAL FILE 2148.dwg, ENTITLED TOPOGRAPHIC SURVEY OF QUANTA RESOURCES SUPERFUND SITE, LONG ISLAND CITY, NY, PROVIDED BY GEDD CORPORATION, DATED JANUARY 11, 2004.

2.) WELL COORDINATES TAKEN FROM A MICROSOFT EXCEL FILE Quanta Samples and Wells.xls, 2148A 8-23-04.xls AND 2148A 4-11-05.xls PROVIDED BY GEDD CORP.

3.) PROPERTY BOUNDARY TAKEN FROM DIGITAL FILE 2148 Boundary.dwg, TITLED "MAP SHOWING BOUNDARY OF BLOCK 312 LOT 86", DATED APRIL 29, 2004, PROVIDED BY GEDD CORP.

4.) DEBRIS PILE BOUNDARY REVISED PER FIELD OBSERVATIONS MADE BY GOLDER ASSOCIATES PERSONNEL DURING SITE VISITS.

5.) LOCATIONS OF MW-7R AND MW-9 DIGITIZED FROM HARDCOPY FIGURE TITLED "GROUNDWATER CONTOURS", PROVIDED BY HALEY & ALDRICH, DATED FEBRUARY 2004.

6.) LOCATION OF MW-7 DIGITIZED FROM HARDCOPY FIGURE TITLED "SITE PLAN WITH SITE INVESTIGATION BORING LOCATIONS", PROVIDED BY ENMRON, DATED SEPTEMBER 2000.

SCALE 25 0 25 50 FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

QUANTA RESOURCES SITE
FEASIBILITY STUDY REPORT
QUEENS COUNTY, NEW YORK

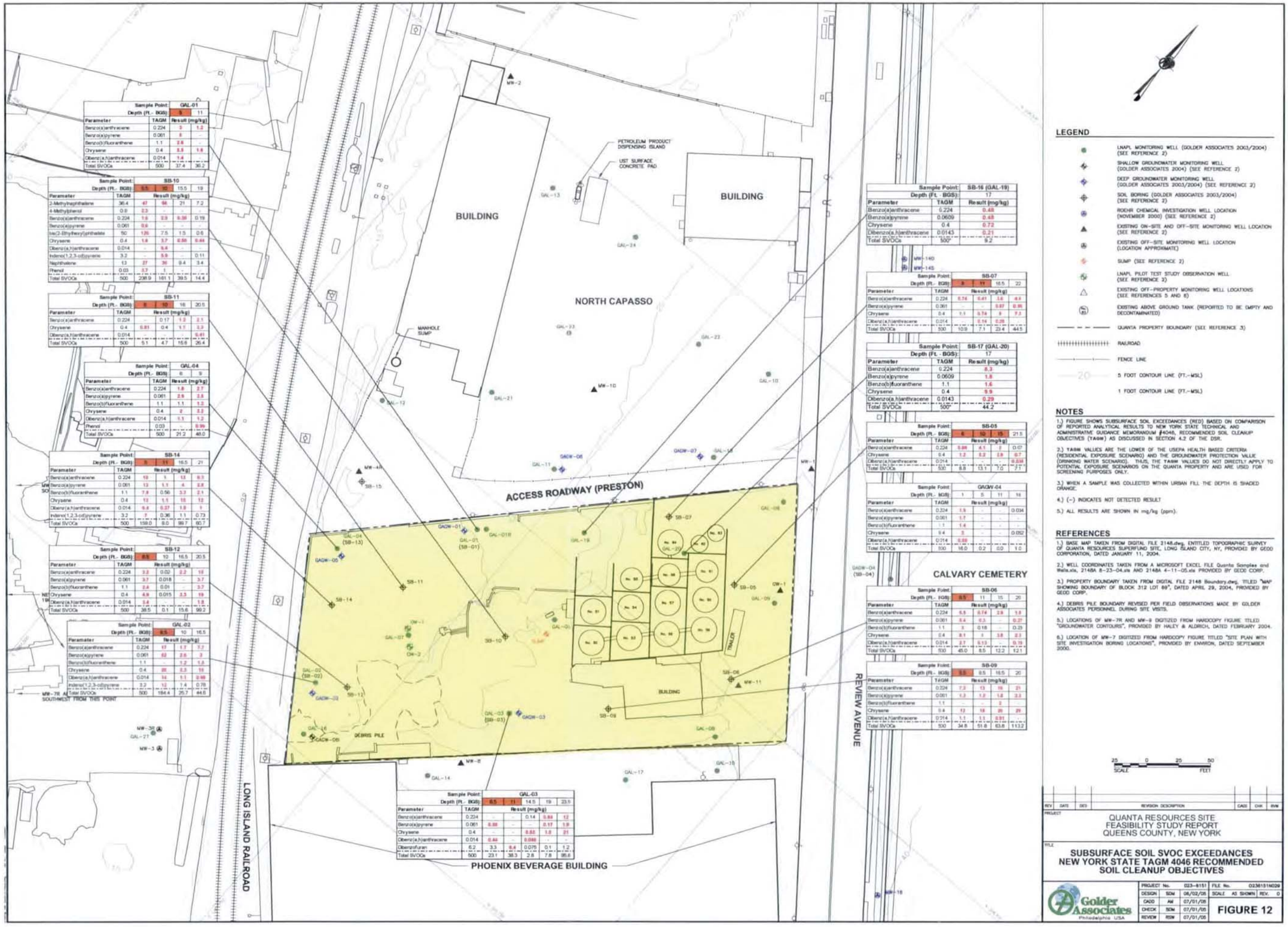
TITLE

SUBSURFACE SOIL VOC EXCEEDANCES OF NEW YORK STATE TAGM 4046 RECOMMENDED SOIL CLEANUP OBJECTIVES

Golder Associates Philadelphia, USA

PROJECT No.	023-8151	FILE No.	023151N028
DESIGN	SDM	06/02/06	SCALE AS SHOWN REV. 0
CADD	AM	07/01/06	
CHECK	SDM	07/01/06	**FIGURE 11**
REVIEW	RSW	07/01/06	

Attachment 6



Sample Point:		GAL-01	
Depth (Ft.- BGS):		5	11
Parameter	TAGM	Result (mg/kg)	
Benzo(a)anthracene	0.224	3	1.2
Benzo(a)pyrene	0.061	5	-
Benzo(b)fluoranthene	1.1	2.6	-
Chrysene	0.4	3.5	1.6
Dibenz(a,h)anthracene	0.014	1.4	-
Total SVOCs	500	37.4	36.2

Sample Point:		SB-10			
Depth (Ft.- BGS):		0.5	10	15.5	19
Parameter	TAGM	Result (mg/kg)			
2-Methylnaphthalene	36.4	47	66	21	7.2
4-Methylphenol	0.9	2.3	-	-	-
Benzo(a)anthracene	0.224	1.9	2.9	0.38	0.19
Benzo(a)pyrene	0.061	0.6	-	-	-
bis(2-Ethylhexyl)phthalate	50	1.25	7.5	1.5	0.6
Chrysene	0.4	1.8	3.7	0.58	0.44
Dibenz(a,h)anthracene	0.014	-	0.4	-	-
Indeno(1,2,3-cd)pyrene	3.2	-	5.9	-	0.11
Naphthalene	13	27	30	9.4	3.4
Phenol	0.03	0.3	1	-	-
Total SVOCs	500	238.9	181.1	39.5	14.4

Sample Point:		SB-11			
Depth (Ft.- BGS):		5	10	16	20.5
Parameter	TAGM	Result (mg/kg)			
Benzo(a)anthracene	0.224	-	0.17	1.2	2.1
Chrysene	0.4	0.81	0.4	1.1	2.3
Dibenz(a,h)anthracene	0.014	-	-	-	0.41
Total SVOCs	500	5.1	4.7	15.6	26.4

Sample Point:		GAL-04	
Depth (Ft.- BGS):		6	9
Parameter	TAGM	Result (mg/kg)	
Benzo(a)anthracene	0.224	1.8	2.7
Benzo(a)pyrene	0.061	2.9	2.8
Benzo(b)fluoranthene	1.1	1.1	1.3
Chrysene	0.4	2	2.1
Dibenz(a,h)anthracene	0.014	1.1	1.2
Phenol	0.03	-	0.99
Total SVOCs	500	21.2	48.0

Sample Point:		SB-14			
Depth (Ft.- BGS):		5	11	16.5	21
Parameter	TAGM	Result (mg/kg)			
Benzo(a)anthracene	0.224	10	1	13	6.3
Benzo(a)pyrene	0.061	13	1.1	4	2.8
Benzo(b)fluoranthene	1.1	7.8	0.56	3.3	2.1
Chrysene	0.4	13	1.1	15	13
Dibenz(a,h)anthracene	0.014	5.8	0.37	1.8	1
Indeno(1,2,3-cd)pyrene	3.2	7	0.36	1.1	0.73
Total SVOCs	500	159.0	8.0	99.7	60.7

Sample Point:		SB-12			
Depth (Ft.- BGS):		0.5	10	16.5	20.5
Parameter	TAGM	Result (mg/kg)			
Benzo(a)anthracene	0.224	3.3	0.02	2.2	19
Benzo(a)pyrene	0.061	3.7	0.018	-	3.7
Benzo(b)fluoranthene	1.1	2.4	0.01	-	3.7
Chrysene	0.4	4.9	0.015	3.3	19
Dibenz(a,h)anthracene	0.014	3.4	-	-	1.8
Total SVOCs	500	38.5	0.1	15.6	99.2

Sample Point:		GAL-02	
Depth (Ft.- BGS):		0.5	10	16.5
Parameter	TAGM	Result (mg/kg)		
Benzo(a)anthracene	0.224	17	1.7	7.7
Benzo(a)pyrene	0.061	62	2.6	3
Benzo(b)fluoranthene	1.1	-	1.2	1.8
Chrysene	0.4	20	2.3	19
Dibenz(a,h)anthracene	0.014	14	1.1	0.98
Indeno(1,2,3-cd)pyrene	3.2	12	1.4	0.78
Total SVOCs	500	184.4	25.7	44.6

Sample Point:		GAL-03				
Depth (Ft.- BGS):		0.5	11	14.5	19	23.5
Parameter	TAGM	Result (mg/kg)				
Benzo(a)anthracene	0.224	-	-	0.14	0.84	12
Benzo(a)pyrene	0.061	0.88	-	-	0.17	1.9
Chrysene	0.4	-	-	0.83	1.8	21
Dibenz(a,h)anthracene	0.014	0.44	-	0.088	-	-
Dibenzofuran	6.2	3.3	0.4	0.075	0.1	1.2
Total SVOCs	500	23.1	38.3	2.8	7.8	95.6

Sample Point:		SB-16 (GAL-19)
Depth (Ft.- BGS):		17
Parameter	TAGM	Result (mg/kg)
Benzo(a)anthracene	0.224	0.48
Benzo(a)pyrene	0.0609	0.48
Chrysene	0.4	0.72
Dibenzo(a,h)anthracene	0.0143	0.21
Total SVOCs	500*	9.2

Sample Point:		SB-07			
Depth (Ft.- BGS):		5	11	16.5	22
Parameter	TAGM	Result (mg/kg)			
Benzo(a)anthracene	0.224	0.74	0.41	1.6	4.4
Benzo(a)pyrene	0.061	-	-	0.87	0.95
Chrysene	0.4	1.1	0.74	1	7.3
Dibenz(a,h)anthracene	0.014	-	0.14	0.25	-
Total SVOCs	500	10.9	7.1	23.4	44.5

Sample Point:		SB-17 (GAL-20)
Depth (Ft.- BGS):		17
Parameter	TAGM	Result (mg/kg)
Benzo(a)anthracene	0.224	0.3
Benzo(a)pyrene	0.0609	1.8
Benzo(b)fluoranthene	1.1	1.6
Chrysene	0.4	0.9
Dibenzo(a,h)anthracene	0.0143	0.29
Total SVOCs	500*	44.2

Sample Point:		SB-05			
Depth (Ft.- BGS):		6	10	15	21.5
Parameter	TAGM	Result (mg/kg)			
Benzo(a)anthracene	0.224	5.88	4.1	1	0.07
Chrysene	0.4	1.2	0.2	1.9	0.7
Dibenz(a,h)anthracene	0.014	-	-	-	0.034
Total SVOCs	500	8.8	13.1	7.0	7.1

Sample Point:		GADW-04			
Depth (Ft.- BGS):		1	5	11	16
Parameter	TAGM	Result (mg/kg)			
Benzo(a)anthracene	0.224	1.9	-	-	0.034
Benzo(a)pyrene	0.061	1.7	-	-	-
Benzo(b)fluoranthene	1.1	1.4	-	-	-
Chrysene	0.4	2	-	-	0.052
Dibenz(a,h)anthracene	0.014	0.68	-	-	-
Total SVOCs	500	16.0	0.2	0.0	1.0

Sample Point:		SB-06			
Depth (Ft.- BGS):		0.5	11	15	20
Parameter	TAGM	Result (mg/kg)			
Benzo(a)anthracene	0.224	5.9	0.74	2.8	1.8
Benzo(a)pyrene	0.061	5.4	0.3	-	0.27
Benzo(b)fluoranthene	1.1	3	0.18	-	0.23
Chrysene	0.4	8.1	1	3.8	2.3
Dibenz(a,h)anthracene	0.014	2.7	0.13	-	0.19
Total SVOCs	500	45.0	8.5	12.2	12.1

Sample Point:		SB-09			
Depth (Ft.- BGS):		0.5	8.5	16.5	20
Parameter	TAGM	Result (mg/kg)			
Benzo(a)anthracene	0.224	7.3	13	16	21
Benzo(a)pyrene	0.061	4.3	1.9	1.8	3.3
Benzo(b)fluoranthene	1.1	-	-	2	-
Chrysene	0.4	12	18	20	29
Dibenz(a,h)anthracene	0.014	1.1	1.5	0.91	-
Total SVOCs	500	34.8	51.8	63.8	113.2

LEGEND

- LNAPL MONITORING WELL (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- SHALLOW GROUNDWATER MONITORING WELL (GOLDER ASSOCIATES 2004) (SEE REFERENCE 2)
- DEEP GROUNDWATER MONITORING WELL (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- SOIL BORING (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- ROEHR CHEMICAL INVESTIGATION WELL LOCATION (NOVEMBER 2000) (SEE REFERENCE 2)
- EXISTING ON-SITE AND OFF-SITE MONITORING WELL LOCATION (SEE REFERENCE 2)
- EXISTING OFF-SITE MONITORING WELL LOCATION (LOCATION APPROXIMATE)
- SUMP (SEE REFERENCE 2)
- LNAPL PILOT TEST STUDY OBSERVATION WELL (SEE REFERENCE 2)
- EXISTING OFF-PROPERTY MONITORING WELL LOCATIONS (SEE REFERENCES 5 AND 6)
- EXISTING ABOVE GROUND TANK (REPORTED TO BE EMPTY AND DECONTAMINATED)
- QUANTA PROPERTY BOUNDARY (SEE REFERENCE 3)
- RAILROAD
- FENCE LINE
- 5 FOOT CONTOUR LINE (FT.-MSL)
- 1 FOOT CONTOUR LINE (FT.-MSL)

NOTES

1.) FIGURE SHOWS SUBSURFACE SOIL EXCEEDANCES (RED) BASED ON COMPARISON OF REPORTED ANALYTICAL RESULTS TO NEW YORK STATE TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM #4046, RECOMMENDED SOIL CLEANUP OBJECTIVES (**TAGM**) AS DISCUSSED IN SECTION 4.2 OF THE DSR.

2.) **TAGM** VALUES ARE THE LOWER OF THE USEPA HEALTH BASED CRITERIA (RESIDENTIAL EXPOSURE SCENARIO) AND THE GROUNDWATER PROTECTION VALUE (DRINKING WATER SCENARIO). THUS, THE **TAGM** VALUES DO NOT DIRECTLY APPLY TO POTENTIAL EXPOSURE SCENARIOS ON THE QUANTA PROPERTY AND ARE USED FOR SCREENING PURPOSES ONLY.

3.) WHEN A SAMPLE WAS COLLECTED WITHIN URBAN FILL THE DEPTH IS SHADED ORANGE.

4.) (-) INDICATES NOT DETECTED RESULT

5.) ALL RESULTS ARE SHOWN IN mg/kg (ppm).

REFERENCES

1.) BASE MAP TAKEN FROM DIGITAL FILE 2148.dwg, ENTITLED TOPOGRAPHIC SURVEY OF QUANTA RESOURCES SUPERFUND SITE, LONG ISLAND CITY, NY, PROVIDED BY GEDD CORPORATION, DATED JANUARY 11, 2004.

2.) WELL COORDINATES TAKEN FROM A MICROSOFT EXCEL FILE Quanta Samples and Wells.xls, 2148A 8-23-04.xls AND 2148A 4-11-05.xls PROVIDED BY GEDD CORP.

3.) PROPERTY BOUNDARY TAKEN FROM DIGITAL FILE 2148 Boundary.dwg, TITLED "MAP SHOWING BOUNDARY OF BLOCK 312 LOT 89", DATED APRIL 29, 2004, PROVIDED BY GEDD CORP.

4.) DEBRIS PILE BOUNDARY REVISED PER FIELD OBSERVATIONS MADE BY GOLDER ASSOCIATES PERSONNEL DURING SITE VISITS.

5.) LOCATIONS OF MW-7R AND MW-8 DIGITIZED FROM HARDCOPY FIGURE TITLED "GROUNDWATER CONTOURS", PROVIDED BY HALEY & ALDRICH, DATED FEBRUARY 2004.

6.) LOCATION OF MW-7 DIGITIZED FROM HARDCOPY FIGURE TITLED "SITE PLAN WITH SITE INVESTIGATION BORING LOCATIONS", PROVIDED BY ENVIRON, DATED SEPTEMBER 2000.

SCALE: 25 0 25 50 FEET

REV	DATE	DES	REVISION DESCRIPTION	CAD	CHK	RVW

PROJECT

QUANTA RESOURCES SITE
FEASIBILITY STUDY REPORT
QUEENS COUNTY, NEW YORK

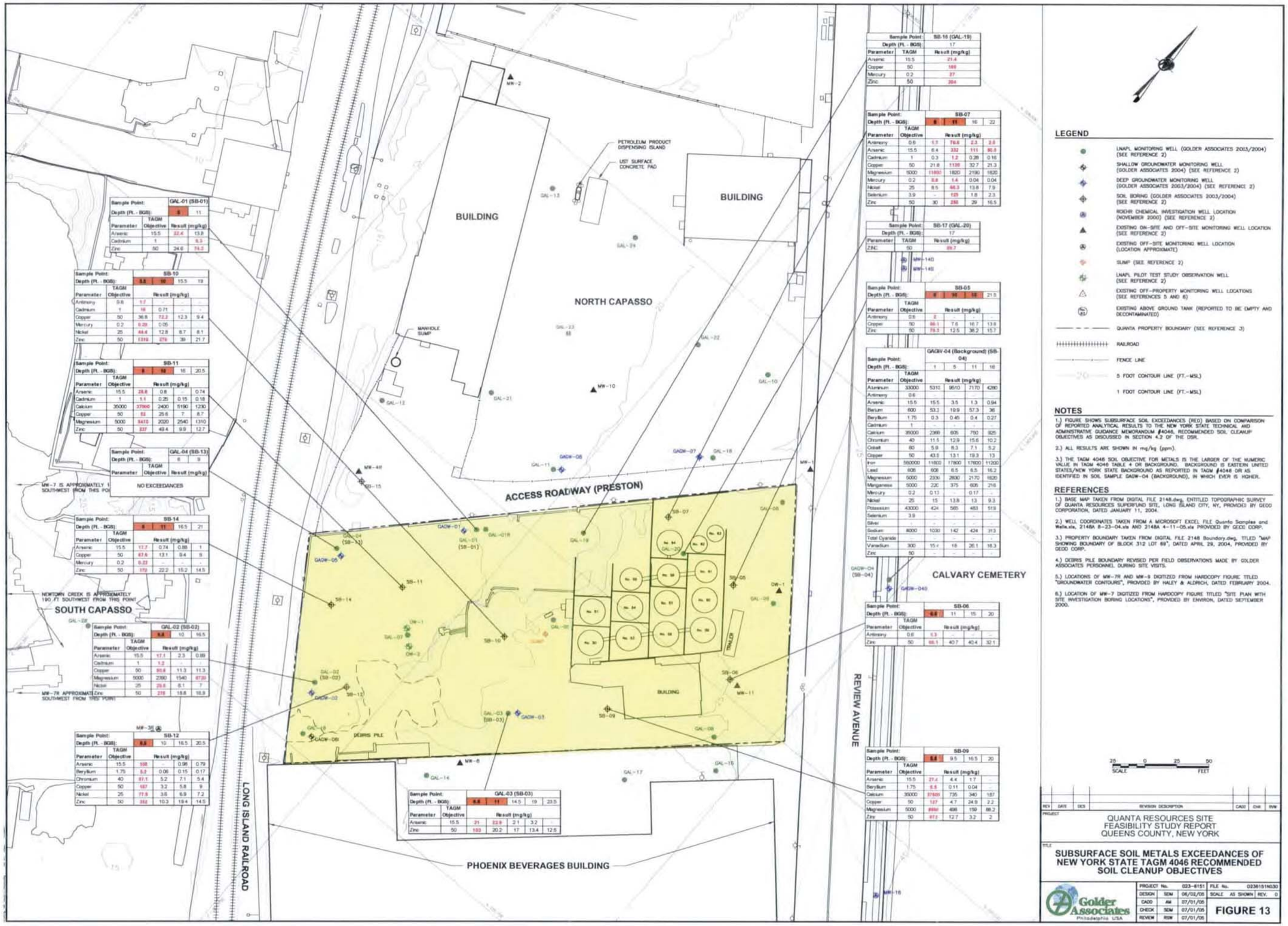
TITLE

SUBSURFACE SOIL SVOC EXCEEDANCES NEW YORK STATE TAGM 4046 RECOMMENDED SOIL CLEANUP OBJECTIVES

Golder Associates Philadelphia USA

PROJECT No.	023-6151	FILE No.	0236151N029
DESIGN	SDM	06/02/05	SCALE AS SHOWN REV. 0
CADD	AM	07/01/05	
CHECK	SDM	07/01/05	FIGURE 12
REVIEW	RSM	07/01/05	

Attachment 6



Sample Point:	GAL-01 (SB-01)	
Depth (Ft. - BGS):	6	11
Parameter / TAGM Objective	Result (mg/kg)	
Arsenic: 15.5	22.4	13.8
Cadmium: 1	-	6.3
Zinc: 50	24.6	74.2

Sample Point:	SB-10			
Depth (Ft. - BGS):	5.5	10	15.5	19
Parameter / TAGM Objective	Result (mg/kg)			
Antimony: 0.6	1.7	-	-	-
Cadmium: 1	16	0.71	-	-
Copper: 50	36.8	72.3	12.3	9.4
Mercury: 0.2	0.29	0.05	-	-
Nickel: 25	44.4	12.8	8.7	8.1
Zinc: 50	1310	276	39	21.7

Sample Point:	SB-11			
Depth (Ft. - BGS):	6	10	16	20.5
Parameter / TAGM Objective	Result (mg/kg)			
Arsenic: 15.5	28.8	0.8	-	0.74
Cadmium: 1	1.1	0.25	0.15	0.18
Calcium: 35000	37900	2400	5190	1230
Copper: 50	53	25.6	7	8.7
Magnesium: 5000	5410	2020	2540	1310
Zinc: 50	227	49.4	9.9	12.7

Sample Point:	GAL-04 (SB-13)	
Depth (Ft. - BGS):	6	9
Parameter / TAGM Objective	Result (mg/kg)	
NO EXCEEDANCES		

Sample Point:	SB-14			
Depth (Ft. - BGS):	6	11	16.5	21
Parameter / TAGM Objective	Result (mg/kg)			
Arsenic: 15.5	17.7	0.74	0.88	1
Copper: 50	67.6	13.1	9.4	9
Mercury: 0.2	0.23	-	-	-
Zinc: 50	170	22.2	15.2	14.5

Sample Point:	GAL-02 (SB-02)		
Depth (Ft. - BGS):	6.5	10	16.5
Parameter / TAGM Objective	Result (mg/kg)		
Arsenic: 15.5	17.1	2.3	0.89
Cadmium: 1	1.2	-	-
Copper: 50	90.8	11.3	11.3
Magnesium: 5000	2360	1540	6730
Nickel: 25	29.6	8.1	7
Zinc: 50	278	18.6	16.9

Sample Point:	SB-12			
Depth (Ft. - BGS):	6.5	10	16.5	20.5
Parameter / TAGM Objective	Result (mg/kg)			
Arsenic: 15.5	108	-	0.96	0.79
Beryllium: 1.75	5.3	0.06	0.15	0.17
Chromium: 40	87.1	5.2	7.1	5.4
Copper: 50	187	3.2	5.8	9
Nickel: 25	77.5	3.6	6.9	7.2
Zinc: 50	552	10.3	19.4	14.5

Sample Point:	GAL-03 (SB-03)				
Depth (Ft. - BGS):	6.5	11	14.5	19	23.5
Parameter / TAGM Objective	Result (mg/kg)				
Arsenic: 15.5	21	23.9	2.1	3.2	-
Zinc: 50	103	20.2	17	13.4	12.5

Sample Point:	SB-16 (GAL-19)
Depth (Ft. - BGS):	17
Parameter / TAGM	Result (mg/kg)
Arsenic: 15.5	21.4
Copper: 50	189
Mercury: 0.2	27
Zinc: 50	204

Sample Point:	SB-07			
Depth (Ft. - BGS):	6	11	16	22
Parameter / TAGM Objective	Result (mg/kg)			
Antimony: 0.6	1.1	76.6	2.3	2.6
Arsenic: 15.5	6.4	332	111	80.9
Cadmium: 1	0.3	1.2	0.28	0.16
Copper: 50	21.8	1130	32.7	21.3
Magnesium: 5000	1930	1820	2190	1820
Mercury: 0.2	0.8	1.4	0.04	0.04
Nickel: 25	8.5	48.3	13.8	7.9
Selenium: 3.9	-	125	1.8	2.3
Zinc: 50	30	288	29	16.5

Sample Point:	SB-17 (GAL-20)
Depth (Ft. - BGS):	17
Parameter: TAGM	Result (mg/kg)
ZINC: 50	69.7

Sample Point:	SB-05			
Depth (Ft. - BGS):	6	10	15	21.5
Parameter / TAGM Objective	Result (mg/kg)			
Antimony: 0.6	2	-	-	-
Copper: 50	80.1	7.6	16.7	13.8
Zinc: 50	79.3	12.5	36.2	15.7

Sample Point:	GADW-04 (Background) (SB-04)			
Depth (Ft. - BGS):	1	5	11	16
Parameter / TAGM Objective	Result (mg/kg)			
Aluminum: 33000	5310	9510	7170	4280
Antimony: 0.6	-	-	-	-
Arsenic: 15.5	15.5	3.5	1.3	0.94
Barium: 600	53.3	19.9	57.3	36
Beryllium: 1.75	0.3	0.45	0.4	0.27
Cadmium: 1	-	-	-	-
Calcium: 35000	2360	605	750	825
Chromium: 40	11.5	12.9	15.6	10.2
Cobalt: 60	5.9	8.3	7.1	5.2
Copper: 50	43.5	13.1	19.3	13
Iron: 550000	11600	17800	17600	11200
Lead: 606	606	6.5	6.5	16.2
Magnesium: 5000	2330	2830	2170	1620
Manganese: 5000	220	375	605	216
Mercury: 0.2	0.13	-	0.17	-
Nickel: 25	15	13.8	13	9.3
Potassium: 43000	424	565	483	519
Selenium: 3.9	-	-	-	-
Silver: -	-	-	-	-
Sodium: 8000	1030	142	424	313
Total Cyanide: -	-	-	-	-
Vanadium: 300	15.4	18	26.1	16.3
Zinc: 50	-	-	-	-

Sample Point:	SB-06			
Depth (Ft. - BGS):	6.5	11	15	20
Parameter / TAGM Objective	Result (mg/kg)			
Antimony: 0.6	5.3	-	-	-
Zinc: 50	66.1	40.7	40.4	32.1

Sample Point:	SB-09			
Depth (Ft. - BGS):	5.5	9.5	16.5	20
Parameter / TAGM Objective	Result (mg/kg)			
Arsenic: 15.5	27.4	4.4	1.7	-
Beryllium: 1.75	5.5	0.11	0.04	-
Calcium: 35000	37800	735	340	187
Copper: 50	127	4.7	24.9	2.2
Magnesium: 5000	8950	406	159	88.2
Zinc: 50	473	12.7	3.2	2

LEGEND

- LNAPL MONITORING WELL (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- SHALLOW GROUNDWATER MONITORING WELL (GOLDER ASSOCIATES 2004) (SEE REFERENCE 2)
- DEEP GROUNDWATER MONITORING WELL (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- SOIL BORING (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- ROCHE CHEMICAL INVESTIGATION WELL LOCATION (NOVEMBER 2000) (SEE REFERENCE 3)
- EXISTING ON-SITE AND OFF-SITE MONITORING WELL LOCATION (SEE REFERENCE 2)
- EXISTING OFF-SITE MONITORING WELL LOCATION (LOCATION APPROXIMATE)
- SUMP (SEE REFERENCE 2)
- LNAPL PILOT TEST STUDY OBSERVATION WELL (SEE REFERENCE 2)
- EXISTING OFF-PROPERTY MONITORING WELL LOCATIONS (SEE REFERENCES 5 AND 6)
- EXISTING ABOVE GROUND TANK (REPORTED TO BE EMPTY AND DECONTAMINATED)
- QUANTA PROPERTY BOUNDARY (SEE REFERENCE 3)
- RAILROAD
- FENCE LINE
- 5 FOOT CONTOUR LINE (FT.-MSL)
- 1 FOOT CONTOUR LINE (FT.-MSL)

NOTES

1.) FIGURE SHOWS SUBSURFACE SOIL EXCEEDANCES (RED) BASED ON COMPARISON OF REPORTED ANALYTICAL RESULTS TO THE NEW YORK STATE TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM #4046, RECOMMENDED SOIL CLEANUP OBJECTIVES AS DISCUSSED IN SECTION 4.2 OF THE DSR.

2.) ALL RESULTS ARE SHOWN IN mg/kg (ppm).

3.) THE TAGM 4046 SOIL OBJECTIVE FOR METALS IS THE LARGER OF THE NUMERIC VALUE IN TAGM 4046 TABLE 4 OR BACKGROUND. BACKGROUND IS EASTERN UNITED STATES/NEW YORK STATE BACKGROUND AS REPORTED IN TAGM #4046 OR AS IDENTIFIED IN SOIL SAMPLE GADW-04 (BACKGROUND), IN WHICH EVER IS HIGHER.

REFERENCES

1.) BASE MAP TAKEN FROM DIGITAL FILE 2148.dwg, ENTITLED TOPOGRAPHIC SURVEY OF QUANTA RESOURCES SUPERFUND SITE, LONG ISLAND CITY, NY, PROVIDED BY GEOD CORPORATION, DATED JANUARY 11, 2004.

2.) WELL COORDINATES TAKEN FROM A MICROSOFT EXCEL FILE Quanta Samples and Wells.xls, 2148A 8-23-04.xls AND 2148A 4-11-05.xls PROVIDED BY GEOD CORP.

3.) PROPERTY BOUNDARY TAKEN FROM DIGITAL FILE 2148 Boundary.dwg, TITLED "MAP SHOWING BOUNDARY OF BLOCK 312 LOT 69", DATED APRIL 29, 2004, PROVIDED BY GEOD CORP.

4.) DEBRIS PILE BOUNDARY REVISED PER FIELD OBSERVATIONS MADE BY GOLDER ASSOCIATES PERSONNEL DURING SITE VISITS.

5.) LOCATIONS OF MW-7R AND MW-8 DIGITIZED FROM HARDCOPY FIGURE TITLED "GROUNDWATER CONTOURS", PROVIDED BY HALEY & ALDRICH, DATED FEBRUARY 2004.

6.) LOCATION OF MW-7 DIGITIZED FROM HARDCOPY FIGURE TITLED "SITE PLAN WITH SITE INVESTIGATION BORING LOCATIONS", PROVIDED BY ENVIRON, DATED SEPTEMBER 2000.

SCALE: 25 0 25 50 FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

QUANTA RESOURCES SITE
FEASIBILITY STUDY REPORT
QUEENS COUNTY, NEW YORK

TITLE

SUBSURFACE SOIL METALS EXCEEDANCES OF NEW YORK STATE TAGM 4046 RECOMMENDED SOIL CLEANUP OBJECTIVES

Golder Associates
Philadelphia USA

PROJECT No.	023-6151	FILE No.	023151N030
DESIGN	SDM	06/02/05	SCALE AS SHOWN REV. 0
CADD	AM	07/01/05	
CHECK	SDM	07/01/05	**FIGURE 13**
REVIEW	RSW	07/01/05	

Attachment 7

1	02/03/09	JBL	SRD	SRD
REV. NO.	DATE	DR. BY	CHK. BY	APP. BY

FIGURE 1

PROPOSED SOIL GAS SAMPLING LOCATIONS: PHOENIX BEVERAGE

Review Avenue Development II
37-80 Review Avenue
Long Island City, New York 11101

Geosyntec consultants

NYSDEC001357

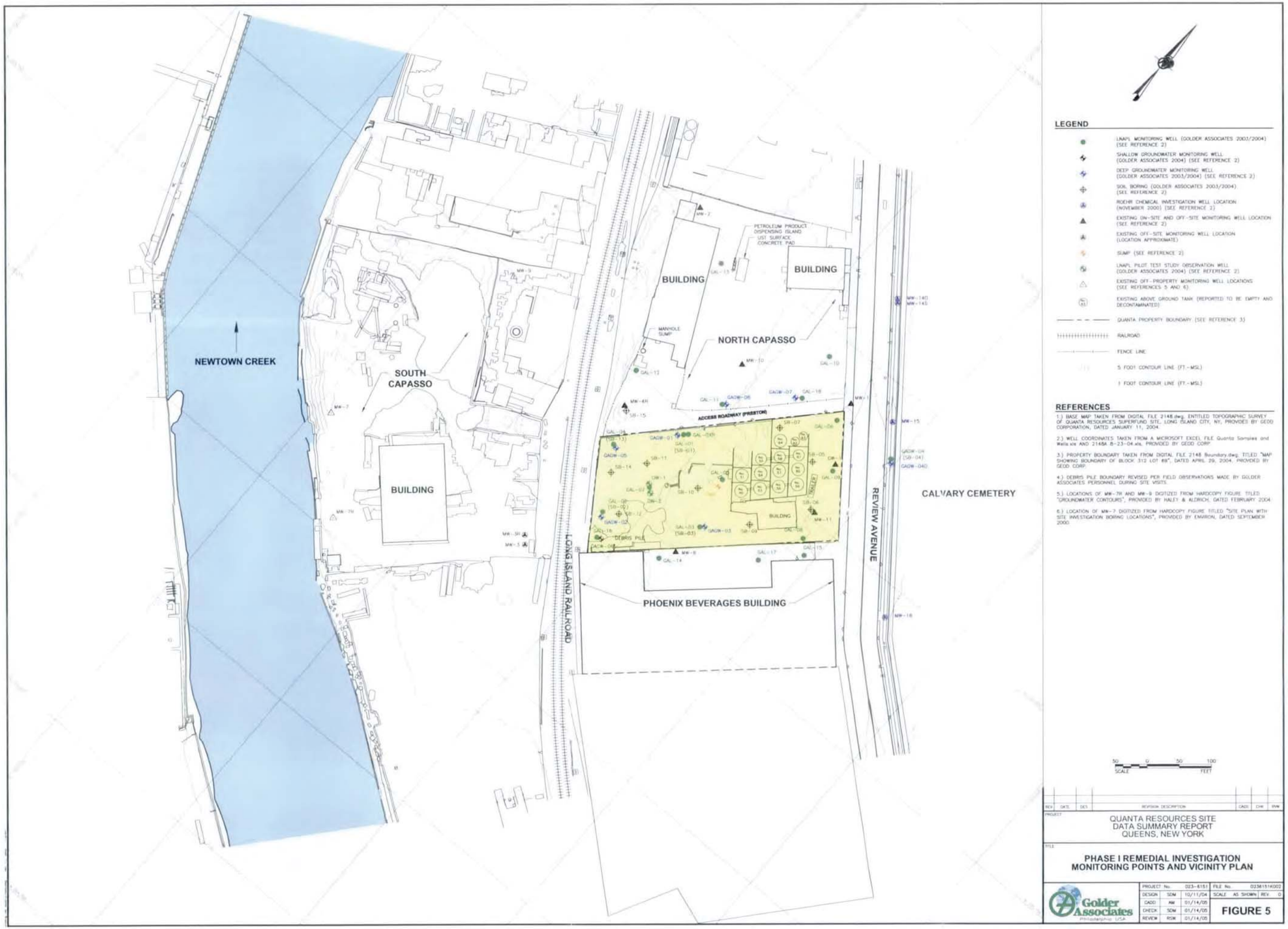
Attachment 8

TABLE 1
MONITORING WELL CONSTRUCTION DATA
QUANTA RESOURCES SITE
37-80 REVIEW AVENUE
LONG ISLAND CITY, NEW YORK

WELL ID	DATE OF INSTALLATION	GROUND SURFACE ELEVATION (FT- MSL)	ELEVATION TOP OF INNER CASING (FT-MSL)	WELL DIAMETER & MATERIAL	TYPE OF WELL	BOTTOM DEPTH OF OUTER PROTECTIVE STEEL CASING (FT-BGS)	WELL DEPTH (FT- BGS)	SCREEN LENGTH (FT)	ELEVATION TOP OF SCREENED INTERVAL (FT - MSL)	ELEVATION BOTTOM OF SCREENED INTERVAL (FT-MSL)
OFF-PROPERTY MONITORING WELLS										
GAGW-04D	August 2, 2004	25.69	25.54	2-INCH SCH 40 PVC	Deep Groundwater Monitoring Well	40	69	10	-33.3	-43.3
GAGW-04	November 10, 2003	25.85	25.53	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	29	15	11.9	-3.2
GAGW-07	June 21, 2004	22.36	22.10	2-INCH SCH 40 PVC	Deep Groundwater Monitoring Well	55	73	10	-40.6	-50.6
GAGW-08	June 17, 2004	19.17	18.92	2-INCH SCH 40 PVC	Deep Groundwater Monitoring Well	50	72	10	-42.8	-52.8
GAL-10	June 15, 2004	23.73	23.24	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	30	15	8.7	-6.3
GAL-11	June 18, 2004	18.79	18.59	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	26	15	7.8	-7.2
GAL-12	June 24, 2004	17.31	16.62	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	30	20	7.3	-12.7
GAL-13	June 16, 2004	18.09	17.74	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	26	15	7.1	-7.9
GAL-14	June 27, 2004	16.27	15.85	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	30	20	6.3	-13.7
GAL-15	June 26, 2004	21.78	21.43	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	28	15	8.8	-6.2
GAL-17	June 26, 2004	16.31	15.82	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	27	15	4.3	-10.7
GAL-18	July 14, 2004	22.69	22.22	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	30	15	7.7	-7.3
GAL-21	March 30, 2005	17.83	17.46	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	25	15	7.8	-7.2
GAL-22	March 31, 2005	21.28	21.11	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	30	15	6.3	-8.7
GAL-23	April 1, 2005	17.95	17.55	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	25	15	8.0	-7.1
GAL-24	March 29, 2005	18.38	17.91	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	26	15	7.4	-7.6
GAL-25	April 3, 2005	16.39	15.76	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	27	20	9.4	-10.6
GAL-26	April 3, 2005	15.83	15.55	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	28	20	7.8	-12.2
GAL-27	February 25, 2005	12.99	12.48	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	20	15	8.0	-7.0
GAL-28	February 28, 2005	12.54	12.40	4-INCH SCH 40 PVC	LNAPL Monitoring Well	NA	20	15	7.5	-7.5

NOTES:
(1) - Monitoring wells surveyed by GEOD Corporation in August 2004 and April 2005.
FT.-BGS: Feet Below Ground Surface
FT.-MSL: Feet Mean Sea Level
NA - Not Applicable

Attachment 9



Attachment 10

TABLE 13A
SUMMARY PHYSICAL CHARACTERISTICS
LNAPL SAMPLE ANALYSES
QUANTA RESOURCES SITE
37-80 REVIEW AVENUE
LONG ISLAND CITY, NEW YORK

		QUANTA PROPERTY WELLS																	
Sample Point:		GAGW-04 *			GAL-01			GAL-01R			GAL-01R (Duplicate)			GAL-02			GAL-03		
Date Sampled:		12/17/2003			11/18/2003			7/16/2004			7/16/2004			11/18/2003			11/18/2003		
Lab ID:		488619			481266			547612			547613			481265			481942		
Parameter	Units	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
% Sediments	wt %	10			0.4			0.34			0.8			0.3			0.05		
% Sulfur	wt %	0.329			0.274			0.323			0.323			0.274			0.416		
BTU/TOT	BTU/TOT	19155			19457			19416			19421			19586			19305		
Flashpoint	deg F	281			201			180			189			280			302		
Interfacial Tension/TOT	dynes/cm	32.55			28.59			12.68			17.85			32.97			31.07		
Specific Gravity	g/cm^3	0.899			0.885			0.891			0.894			0.899			0.899		
Surface Tension/TOT	dynes/cm	38			38.5			33			35.5			38			37.5		
TOX/TOT	mg/kg	5			321			279.43			223.03			155			23		
Viscosity	cSt	41.34			106			82.1			74.15			117.6			51.81		

		QUANTA PROPERTY WELLS																	
Sample Point:		GAL-04			GAL-05			GAL-06			GAL-07			GAL-07B			GAL-08		
Date Sampled:		11/25/2003			11/19/2003			11/17/2003			11/17/2003			11/19/2003			11/25/2003		
Lab ID:		483777			481943			481263			481264			481944			483778		
Parameter	Units	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
% Sediments	wt %	0.2			0.05			0.05			0.05			0.2			0.05		
% Sulfur	wt %	0.234			0.38			0.331			0.294			0.29			0.223		
BTU/TOT	BTU/TOT	19377			19411			19326			19391			19327			19343		
Flashpoint	deg F	224			277			201			275			260			209		
Interfacial Tension/TOT	dynes/cm	30.5			30.24			32.94			34.38			29.67			30.5		
Specific Gravity	g/cm^3	0.892			0.897			0.897			0.903			0.898			0.915		
Surface Tension/TOT	dynes/cm	30.5			38			39			39			38			30.5		
TOX/TOT	mg/kg	259			38.72			9.56			34.54			23.17			66.69		
Viscosity	cSt	75.9			49.87			30.72			45.02			45.91			47.13		

Notes:

See "Notes and Qualifiers for Analytical Results" for qualifier definitions in Appendix H.

"-" indicates that the constituent was not detected as qualified by "U " or "UJ".

* - Wells GAGW-04 and MW-15 are located north of the Quanta property across from Review Avenue.

Attachment 10

TABLE 13A
SUMMARY PHYSICAL CHARACTERISTICS
LNAPL SAMPLE ANALYSES
QUANTA RESOURCES SITE
37-80 REVIEW AVENUE
LONG ISLAND CITY, NEW YORK

		QUANTA PROPERTY WELLS																				
Sample Point:		GAL-09			GAL-16			GAL-19			GAL-20			MW-11			MW-15 *			Sump (Quanta)		
Date Sampled:		7/10/2004			7/10/2004			4/5/2005			4/6/2005			11/20/2003			7/12/2004			1/14/2004		
Lab ID:		545882			545883			621334			622082			482760			ORGANIC			494865		
Parameter	Units	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
% Sediments	wt %	-			0.2			49			0.1			0.06			24			1.2		
% Sulfur	wt %	0.38			0.342			0.28			0.353			0.373			0.306			0.385		
BTU/TOT	BTU/TOT	19250			19307			16625			19554			19375			19242			16278		
Flashpoint	deg F	219			303			178			207			219			288			280		
Interfacial Tension/TOT	dynes/cm	20.64			20.77			29.1			29			30.3			10.64			10.68		
Specific Gravity	g/cm^3	0.898			0.905			0.8924			0.8976			0.895			0.898			0.9028		
Surface Tension/TOT	dynes/cm	36			36.5			36.2			37.2			30.3			36			34		
TOX/TOT	mg/kg	7.03			17.89			174.43			10.52			29.47			13.57			456.8		
Viscosity	cSt	34.34			66.15			47.67			37.71			37.33			41.03			254.9		

		NORTH CAPASSO WELLS																				
Sample Point:		GAL-10			GAL-10 (duplicate)			GAL-11			GAL-12			GAL-13			GAL-18			GAL-21		
Date Sampled:		7/9/2004			7/9/2004			7/9/2004			7/9/2004			7/9/2004			7/16/2004			4/5/2005		
Lab ID:		545873			545874			545870			545876			545871			547611			621338		
Parameter	Units	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
% Sediments	wt %	1.2			2.4			0.8			0.8			0.2			0.3			0.15		
% Sulfur	wt %	0.202			0.172			0.255			0.241			0.18			0.281			0.231		
BTU/TOT	BTU/TOT	19295			19307			19337			19366			19464			19324			19556		
Flashpoint	deg F	165			163			178			230			141			155			162		
Interfacial Tension/TOT	dynes/cm	16			19.29			15.78			17.26			17.41			15.97			31.5		
Specific Gravity	g/cm^3	0.889			0.888			0.875			0.9009			0.875			0.892			0.8888		
Surface Tension/TOT	dynes/cm	35.8			34.8			36			35.5			35			34.5			36.4		
TOX/TOT	mg/kg	37.29			33.43			177.54			74.27			46.95			67.68			187.1		
Viscosity	cSt	25.43			27.32			50.55			45.93			23.27			27.85			41.59		

Notes:

See "Notes and Qualifiers for Analytical Results" for qualifier definitions in Appendix H.

"-" indicates that the constituent was not detected as qualified by "U " or "UJ".

* - Wells GAGW-04 and MW-15 are located north of the Quanta property across from Review Avenue.

TABLE 13A
SUMMARY PHYSICAL CHARACTERISTICS
LNAPL SAMPLE ANALYSES
QUANTA RESOURCES SITE
37-80 REVIEW AVENUE
LONG ISLAND CITY, NEW YORK

		NORTH CAPASSO WELLS																		
Sample Point:		DGAL-21			GAL-22			GAL-23			GAL-24			MW-4R			MW-10			MH-Sump (North
Date Sampled:		4/5/2005			4/5/2005			4/5/2005			4/5/2005			7/9/2004			7/9/2004			8/13/2004
Lab ID:		621339			621335			621337			621336			545875			545872			554895
Parameter	Units	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
% Sediments	wt %	2.5			3			0.15			0.2			0.2			0.4			14		
% Sulfur	wt %	0.222			0.207			0.19			0.171			0.232			0.208			0.35		
BTU/TOT	BTU/TOT	19643			19516			19464			19705			19210			19303			16879		
Flashpoint	deg F	164			158			156			145			229			168			298		
Interfacial Tension/TOT	dynes/cm	30			28.94			31.1			32			16.62			17.09			9.79		
Specific Gravity	g/cm^3	0.8907			0.8878			0.8878			0.8795			0.9			0.891			0.891		
Surface Tension/TOT	dynes/cm	36.8			35.5			36.1			35.2			36			35.5			34		
TOX/TOT	mg/kg	130.71			43.25			73.56			57.98			122.34			76.14			83.55		
Viscosity	cSt	41.63			26.64			31.83			21.81			54.99			36.8			184.2		

		PHOENIX BEVERAGES WELLS											
Sample Point:		GAL-14			GAL-17			GAL-26			MW-8		
Date Sampled:		7/10/2004			7/10/2004			4/9/2005			7/10/2004		
Lab ID:		545881			545879			625468			545880		
Parameter	Units	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
% Sediments	wt %	0.2			0.4			50			-		
% Sulfur	wt %	0.39			0.444			0.402			0.387		
BTU/TOT	BTU/TOT	19245			19283			19091			19246		
Flashpoint	deg F	294			305			278			292		
Interfacial Tension/TOT	dynes/cm	23.19			23.14			33.5			20.76		
Specific Gravity	g/cm^3	0.906			0.9039			0.9084			0.905		
Surface Tension/TOT	dynes/cm	35.5			36			34			36		
TOX/TOT	mg/kg	-			-			< 5.0			9.27		
Viscosity	cSt	49.56			50.12			58.99			51.22		

Notes:

See "Notes and Qualifiers for Analytical Results" for qualifier definitions in Appendix H.

"-" indicates that the constituent was not detected as qualified by "U " or "UJ".

* - Wells GAGW-04 and MW-15 are located north of the Quanta property across from Review Avenue.

Attachment 10

LEGEND

- LNAPL MONITORING WELL (GOLDER ASSOCIATES 2003/2004/2005) (SEE REFERENCE 2)
- SHALLOW GROUNDWATER MONITORING WELL (GOLDER ASSOCIATES 2004) (SEE REFERENCE 2)
- DEEP GROUNDWATER MONITORING WELL (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- SOIL BORING (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- ROEHR CHEMICAL INVESTIGATION WELL LOCATION (NOVEMBER 2000) (SEE REFERENCE 2)
- EXISTING ON-SITE AND OFF-SITE MONITORING WELL LOCATION (SEE REFERENCE 2)
- EXISTING OFF-SITE MONITORING WELL LOCATION (LOCATION APPROXIMATE)
- SUMP (SEE REFERENCE 2)
- LNAPL PILOT TEST STUDY OBSERVATION WELL (SEE REFERENCE 2)
- EXISTING OFF-PROPERTY MONITORING WELL LOCATIONS (SEE REFERENCES 5 AND 6)
- EXISTING ABOVE GROUND TANK (REPORTED TO BE EMPTY AND DECONTAMINATED)
- 50 — INTERPRETED VISCOSITY CONTOUR (cSt) (DASHED WHERE INFERRED)
- 41.34 — VISCOSITY VALUES (cSt)
- QUANTA PROPERTY BOUNDARY (SEE REFERENCE 3)
- RAILROAD
- FENCE LINE
- 20 — 5 FOOT CONTOUR LINE (FT.-MSL)
- 1 FOOT CONTOUR LINE (FT.-MSL)

REFERENCES

1.) BASE MAP TAKEN FROM DIGITAL FILE 2148.dwg, ENTITLED TOPOGRAPHIC SURVEY OF QUANTA RESOURCES SUPERFUND SITE, LONG ISLAND CITY, NY, PROVIDED BY GEDD CORPORATION, DATED JANUARY 11, 2004.

2.) WELL COORDINATES TAKEN FROM A MICROSOFT EXCEL FILE Quanta Samples and Wells.xls, 2148A 8-23-04.xls AND 2148A 4-11-05.xls, PROVIDED BY GEDD CORP.

3.) PROPERTY BOUNDARY TAKEN FROM DIGITAL FILE 2148 Boundary.dwg, TITLED "MAP SHOWING BOUNDARY OF BLOCK 313 LOT 88", DATED APRIL 29, 2004, PROVIDED BY GEDD CORP.

4.) DEBRIS PILE BOUNDARY REVISED PER FIELD OBSERVATIONS MADE BY GOLDER ASSOCIATES PERSONNEL DURING SITE VISITS.

5.) LOCATION OF MW-9 DIGITIZED FROM HARDCOPY FIGURE TITLED "GROUNDWATER CONTOURS", PROVIDED BY HALEY & ALDRICH, DATED FEBRUARY 2004.

6.) LOCATION OF MW-7 DIGITIZED FROM HARDCOPY FIGURE TITLED "SITE PLAN WITH SITE INVESTIGATION BORING LOCATIONS", PROVIDED BY ENVIRON, DATED SEPTEMBER 2000.

7.) LNAPL DATA USED FOR ISOCONCENTRATIONS WAS BASED ON LNAPL SAMPLES COLLECTED IN JULY 2004 FOR THE PHASE I WELLS AND MARCH/APRIL 2005 FOR THE PHASE II WELLS (GAL-19 THROUGH GAL-28).

SCALE 25 0 25 50 FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT
QUANTA RESOURCES SITE
FEASIBILITY STUDY REPORT
QUEENS COUNTY, NEW YORK

TITLE
INTERPRETED LNAPL VISCOSITY ISOCONCENTRATION CONTOUR MAP

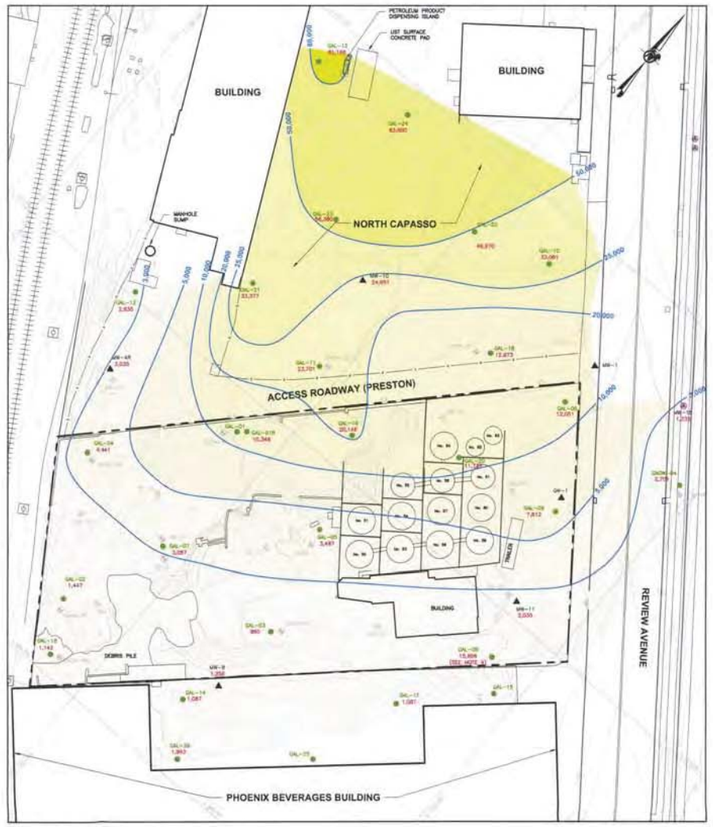
Golder Associates
Philadelphia, USA

PROJECT No.	023-6151		FILE No.	0236151N031	
DESIGN	JLH	08/02/05	SCALE	AS SHOWN	REV. 0
CADD	RG	07/01/05			
CHECK	SDM	07/01/05			
REVIEW	RSW	07/01/05			

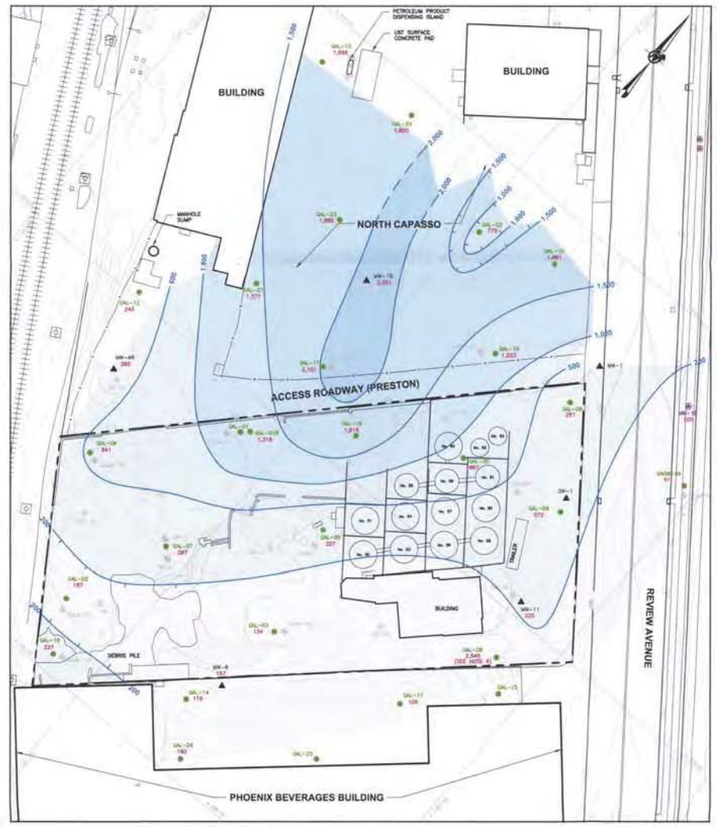
FIGURE 14

Attachment 11

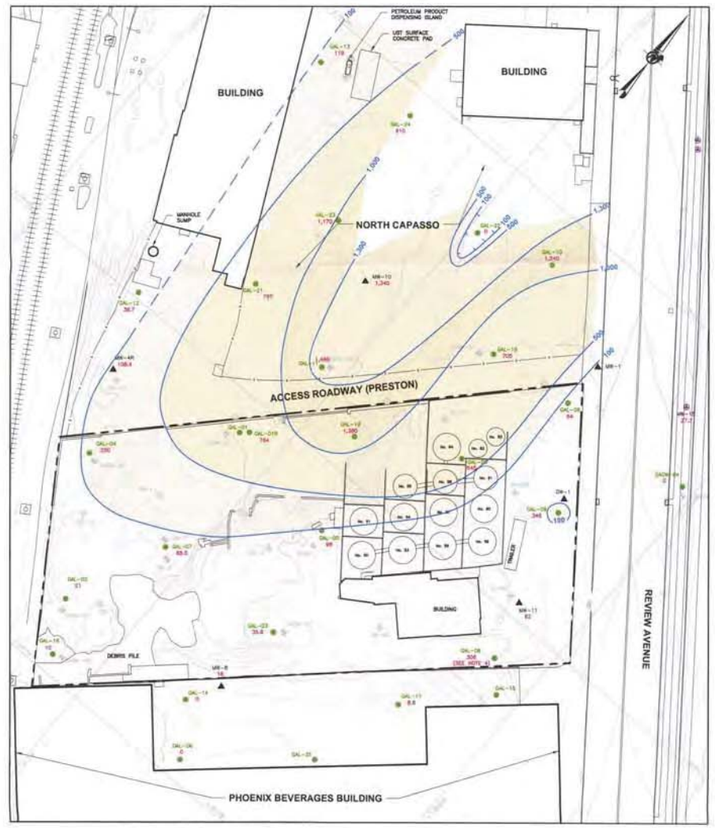
TOTAL VOCs PLUS TICs



TOTAL VOCs



BTEX



LEGEND

- LNAPL MONITORING WELL (GOLDER ASSOCIATES 2003/2004/2005) (SEE REFERENCE 2)
- SHALLOW GROUNDWATER MONITORING WELL (GOLDER ASSOCIATES 2004) (SEE REFERENCE 2)
- DEEP GROUNDWATER MONITORING WELL (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- SOIL BORING (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- ROEHR CHEMICAL INVESTIGATION WELL LOCATION (NOVEMBER 2000) (SEE REFERENCE 2)
- EXISTING ON-SITE AND OFF-SITE MONITORING WELL LOCATION (SEE REFERENCE 2)
- EXISTING OFF-SITE MONITORING WELL LOCATION (LOCATION APPROXIMATE)
- SUMP (SEE REFERENCE 2)
- LNAPL PILOT TEST STUDY OBSERVATION WELL (SEE REFERENCE 2)
- EXISTING OFF-PROPERTY MONITORING WELL LOCATIONS (SEE REFERENCES 5 AND 6)
- (No. 63) EXISTING ABOVE GROUND TANK (REPORTED TO BE EMPTY)
- 1,087 TOTAL VOCs PLUS TICs, TOTAL VOCs AND TOTAL BTEX CONCENTRATION (mg/kg)
- QUANTA PROPERTY BOUNDARY (SEE REFERENCE 3)
- RAILROAD
- FENCE LINE
- 5 FOOT CONTOUR LINE (FT.-MSL)
- 1 FOOT CONTOUR LINE (FT.-MSL)
- 100 INTERPRETED TOTAL VOCs PLUS TICs, TOTAL VOCs AND TOTAL BTEX CONTOUR (MG/KG) (DASHED WHERE INFERRED)

NOTES

1.) VOC – VOLATILE ORGANIC COMPOUND

2.) TIC – TENTATIVELY IDENTIFIED COMPOUND

3.) BTEX – BENZENE, TOLUENE, ETHYLBENZENE AND XYLENE.

4.) GAL-08 IS BELIEVED TO MONITOR A UNIQUE AND LOCALIZED CHEMICAL CONDITION AND THEREFORE IS NOT INCLUDED IN THE CONTOURING SCHEME.

5.) LANPL DATA USED FOR ISOCONCENTRATIONS WAS BASED ON LNAPL SAMPLES COLLECTED IN JULY 2004 FOR THE PHASE I WELLS AND MARCH/APRIL 2005 FOR THE PHASE II WELLS (GAL-19 THROUGH GAL-28).

REFERENCES

1.) BASE MAP TAKEN FROM DIGITAL FILE 2148.dwg, ENTITLED TOPOGRAPHIC SURVEY OF QUANTA RESOURCES SUPERFUND SITE, LONG ISLAND CITY, NY, PROVIDED BY GEOD CORPORATION, DATED JANUARY 11, 2004.

2.) WELL COORDINATES TAKEN FROM A MICROSOFT EXCEL FILE QUANTA SAMPLES AND WELLS.XLS. 2148A 8-23-04.XLS AND 2148A 4-11-05.XLS, PROVIDED BY GEOD CORP.

3.) PROPERTY BOUNDARY TAKEN FROM DIGITAL FILE 2148 Boundary.dwg, TITLED "MAP SHOWING BOUNDARY OF BLOCK 312 LOT 69", DATED APRIL 29, 2004, PROVIDED BY GEOD CORP.

4.) DEBRIS PILE BOUNDARY REVISED PER FIELD OBSERVATIONS MADE BY GOLDER ASSOCIATES PERSONNEL DURING SITE VISITS.

5.) LOCATION MW-9 DIGITIZED FROM HARDCOPY FIGURE TITLED "GROUNDWATER CONTOURS", PROVIDED BY HALEY & ALDRICH, DATED FEBRUARY 2004.

6.) LOCATION MW-7 DIGITIZED FROM HARDCOPY FIGURE TITLED "SITE PLAN WITH SITE INVESTIGATION BORING LOCATIONS", PROVIDED BY ENVIRON, DATED SEPTEMBER 2000.

40 0 40 80
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

QUANTA RESOURCES SITE
FEASIBILITY STUDY REPORT
QUEENS COUNTY, NEW YORK

TITLE

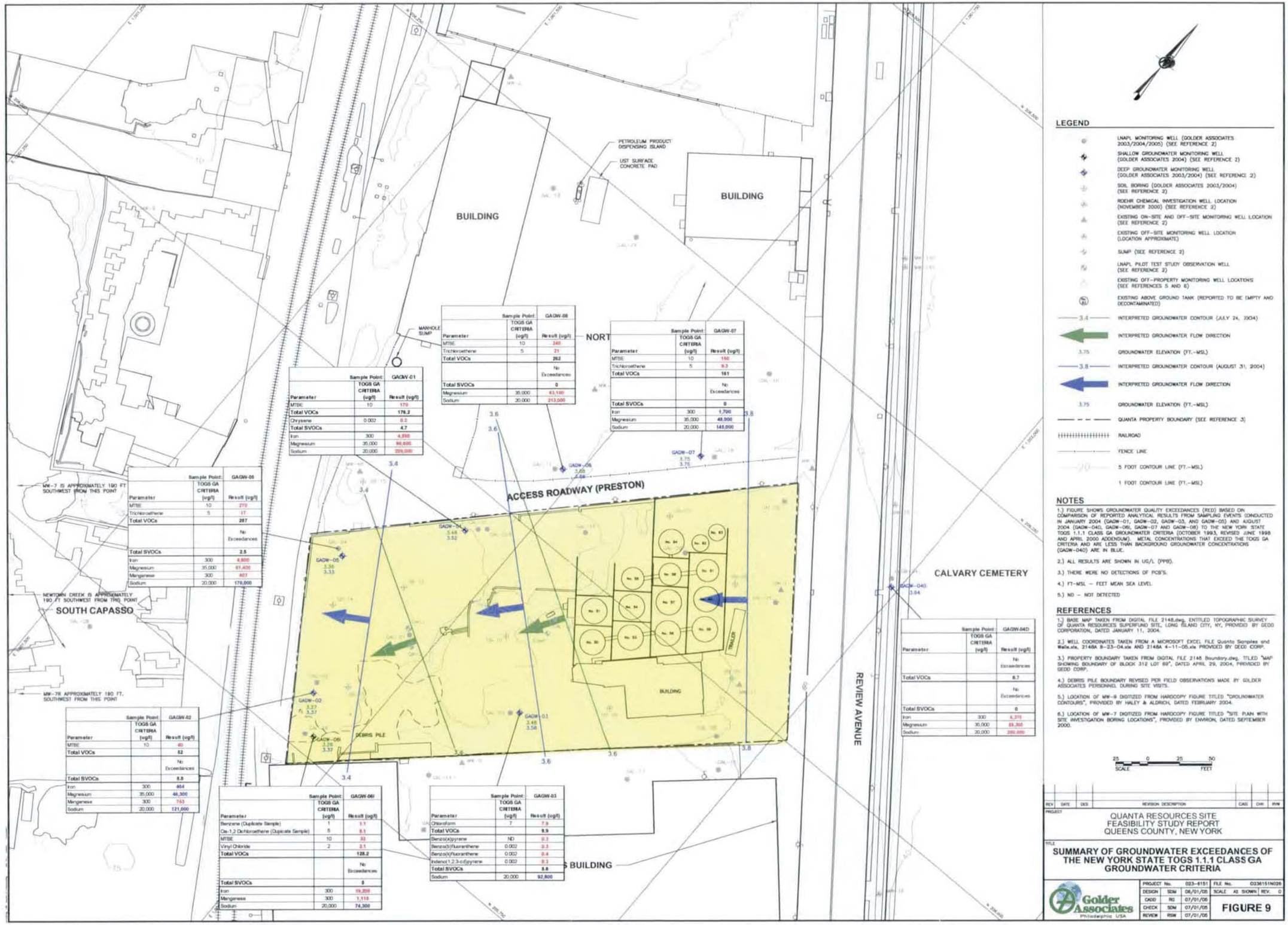
INTERPRETED DISTRIBUTION OF TOTAL VOCs PLUS TICs; TOTAL VOCs; AND BTEX IN LNAPL

Golder Associates
Philadelphia USA

PROJECT No.	023-6151	FILE No.	0236151N032		
DESIGN	SDM	06/02/05	SCALE	AS SHOWN	REV. 0
CADD	AM	07/01/05			
CHECK	SDM	07/01/05			
REVIEW	RSW	07/01/05			

FIGURE 15

Attachment 12



Parameter	Sample Point:	GAGW-08
	TOGS GA CRITERIA (ug/l)	Result (ug/l)
MTBE	10	240
Trichloroethene	5	21
Total VOCs		**262**
		No Exceedances
Total SVOCs		**0**
Magnesium	35,000	43,100
Sodium	20,000	213,000

Parameter	Sample Point:	GAGW-07
	TOGS GA CRITERIA (ug/l)	Result (ug/l)
MTBE	10	150
Trichloroethene	5	9.3
Total VOCs		**161**
		No Exceedances
Total SVOCs		**0**
Iron	300	1,700
Magnesium	35,000	48,900
Sodium	20,000	148,000

Parameter	Sample Point:	GAGW-01
	TOGS GA CRITERIA (ug/l)	Result (ug/l)
MTBE	10	170
Total VOCs		**176.2**
Chrysene	0.002	6.2
Total SVOCs		**4.7**
Iron	300	4,890
Magnesium	35,000	66,600
Sodium	20,000	209,000

Parameter	Sample Point:	GAGW-05
	TOGS GA CRITERIA (ug/l)	Result (ug/l)
MTBE	10	270
Trichloroethene	5	17
Total VOCs		**287**
		No Exceedances
Total SVOCs		**2.5**
Iron	300	4,800
Magnesium	35,000	61,400
Manganese	300	407
Sodium	20,000	176,000

Parameter	Sample Point:	GAGW-02
	TOGS GA CRITERIA (ug/l)	Result (ug/l)
MTBE	10	40
Total VOCs		**52**
		No Exceedances
Total SVOCs		**8.8**
Iron	300	464
Magnesium	35,000	46,300
Manganese	300	763
Sodium	20,000	121,000

Parameter	Sample Point:	GAGW-06I
	TOGS GA CRITERIA (ug/l)	Result (ug/l)
Benzene (Duplicate Sample)	1	1.1
Cis-1,2 Dichloroethene (Duplicate Sample)	5	8.1
MTBE	10	32
Vinyl Chloride	2	2.1
Total VOCs		**128.2**
		No Exceedances
Total SVOCs		**0**
Iron	300	19,200
Manganese	300	1,110
Sodium	20,000	74,300

Parameter	Sample Point:	GAGW-03
	TOGS GA CRITERIA (ug/l)	Result (ug/l)
Chloroform	7	7.9
Total VOCs		**9.9**
Benzo(a)pyrene	ND	0.3
Benzo(b)fluoranthene	0.002	0.3
Benzo(k)fluoranthene	0.002	0.4
Indeno(1,2,3-cd)pyrene	0.002	0.3
Total SVOCs		**0.8**
Sodium	20,000	92,800

Parameter	Sample Point:	GAGW-04D
	TOGS GA CRITERIA (ug/l)	Result (ug/l)
		No Exceedances
Total VOCs		**8.7**
		No Exceedances
Total SVOCs		**0**
Iron	300	4,310
Magnesium	35,000	69,300
Sodium	20,000	280,000

LEGEND

- LNAPL MONITORING WELL (GOLDER ASSOCIATES 2003/2004/2005) (SEE REFERENCE 2)
- SHALLOW GROUNDWATER MONITORING WELL (GOLDER ASSOCIATES 2004) (SEE REFERENCE 2)
- DEEP GROUNDWATER MONITORING WELL (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- SOIL BORING (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 2)
- ROEHR CHEMICAL INVESTIGATION WELL LOCATION (NOVEMBER 2000) (SEE REFERENCE 2)
- EXISTING ON-SITE AND OFF-SITE MONITORING WELL LOCATION (SEE REFERENCE 2)
- EXISTING OFF-SITE MONITORING WELL LOCATION (LOCATION APPROXIMATE)
- SUMP (SEE REFERENCE 2)
- LNAPL PILOT TEST STUDY OBSERVATION WELL (SEE REFERENCE 2)
- EXISTING OFF-PROPERTY MONITORING WELL LOCATIONS (SEE REFERENCES 5 AND 6)
- EXISTING ABOVE GROUND TANK (REPORTED TO BE EMPTY AND DECONTAMINATED)
- 3.4 — INTERPRETED GROUNDWATER CONTOUR (JULY 24, 2004)
- INTERPRETED GROUNDWATER FLOW DIRECTION
- 3.75 GROUNDWATER ELEVATION (FT.-MSL)
- 3.8 — INTERPRETED GROUNDWATER CONTOUR (AUGUST 31, 2004)
- INTERPRETED GROUNDWATER FLOW DIRECTION
- 3.75 GROUNDWATER ELEVATION (FT.-MSL)
- QUANTA PROPERTY BOUNDARY (SEE REFERENCE 3)
- RAILROAD
- FENCE LINE
- 5 FOOT CONTOUR LINE (FT.-MSL)
- 1 FOOT CONTOUR LINE (FT.-MSL)

NOTES

1.) FIGURE SHOWS GROUNDWATER QUALITY EXCEEDANCES (RED) BASED ON COMPARISON OF REPORTED ANALYTICAL RESULTS FROM SAMPLING EVENTS CONDUCTED IN JANUARY 2004 (GAGW-01, GAGW-02, GAGW-03, AND GAGW-05) AND AUGUST 2004 (GAGW-04D, GAGW-06I, GAGW-07 AND GAGW-08) TO THE NEW YORK STATE TOGS 1.1.1 CLASS GA GROUNDWATER CRITERIA (OCTOBER 1993, REVISED JUNE 1998 AND APRIL 2000 ADDENDUM). METAL CONCENTRATIONS THAT EXCEED THE TOGS GA CRITERIA AND ARE LESS THAN BACKGROUND GROUNDWATER CONCENTRATIONS (GAGW-04D) ARE IN BLUE.

2.) ALL RESULTS ARE SHOWN IN UG/L (PPB).

3.) THERE WERE NO DETECTIONS OF PCB'S.

4.) FT-MSL = FEET MEAN SEA LEVEL.

5.) ND = NOT DETECTED

REFERENCES

1.) BASE MAP TAKEN FROM DIGITAL FILE 2148.dwg, ENTITLED TOPOGRAPHIC SURVEY OF QUANTA RESOURCES SUPERFUND SITE, LONG ISLAND CITY, NY, PROVIDED BY GEDD CORPORATION, DATED JANUARY 11, 2004.

2.) WELL COORDINATES TAKEN FROM A MICROSOFT EXCEL FILE Quanta Samples and Wells.xls, 2148A 8-23-04.xls AND 2148A 4-11-05.xls PROVIDED BY GEDD CORP.

3.) PROPERTY BOUNDARY TAKEN FROM DIGITAL FILE 2148 Boundary.dwg, TITLED "MAP SHOWING BOUNDARY OF BLOCK 312 LOT 69", DATED APRIL 29, 2004, PROVIDED BY GEDD CORP.

4.) DEBRIS PILE BOUNDARY REVISED PER FIELD OBSERVATIONS MADE BY GOLDER ASSOCIATES PERSONNEL DURING SITE VISITS.

5.) LOCATION OF MW-9 DIGITIZED FROM HARDCOPY FIGURE TITLED "GROUNDWATER CONTOURS", PROVIDED BY HALEY & ALDRICH, DATED FEBRUARY 2004.

6.) LOCATION OF MW-7 DIGITIZED FROM HARDCOPY FIGURE TITLED "SITE PLAN WITH SITE INVESTIGATION BORING LOCATIONS", PROVIDED BY ENVIRON, DATED SEPTEMBER 2000.

SCALE 25 0 25 50 FEET

REV	DATE	DES	REVISION DESCRIPTION	CAS	CHK	RVW

PROJECT
QUANTA RESOURCES SITE
FEASIBILITY STUDY REPORT
QUEENS COUNTY, NEW YORK

TITLE
SUMMARY OF GROUNDWATER EXCEEDANCES OF THE NEW YORK STATE TOGS 1.1.1 CLASS GA GROUNDWATER CRITERIA

Golder Associates Philadelphia USA

PROJECT No.	023-6151	FILE No.	0236151N026		
DESIGN	SDM	06/01/05	SCALE AS SHOWN	REV.	0
CADD	RG	07/01/05			
CHECK	SDM	07/01/05			
REVIEW	RSK	07/01/05			

FIGURE 9